UNIVERSITY
LIBRARY
NOTTINGHAM

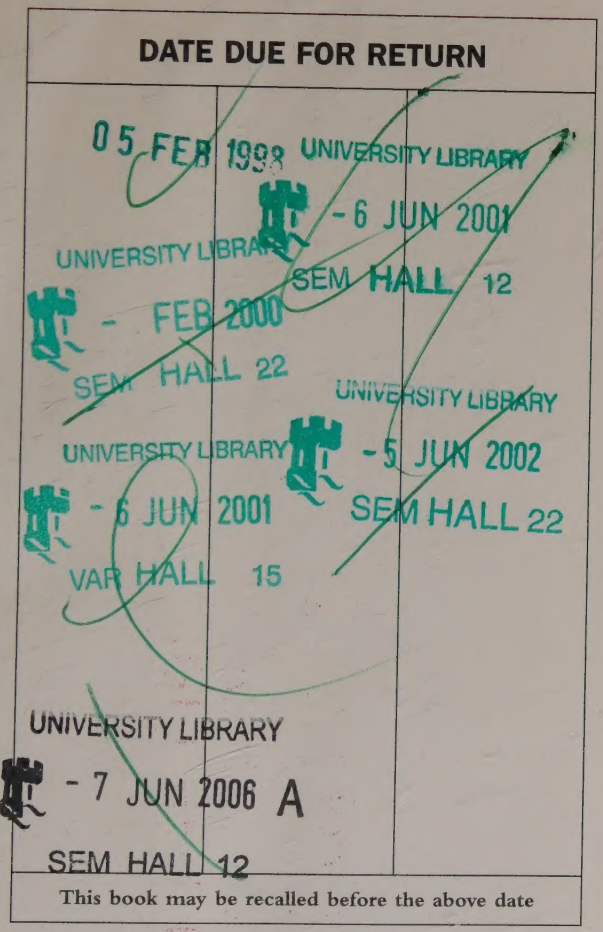
Author STURGIS
Class Mark NA200574
Book No. 6008611

UNIVERSITY
OF NOTTINGHAM
LIBRARY

AKS
08/01/13

UNIVERSITY OF NOTTINGHAM
WITHDRAWN
FROM THE LIBRARY

UNIVERSITY OF NOTTINGHAM
TELEPEN
WITHDRAWN
FROM THE LIBRARY



90014

EUROPEAN ARCHITECTURE

The
Co.

EUROPEAN ARCHITECTURE

A HISTORICAL STUDY

BY

RUSSELL STURGIS, A.M., PH.D., F.A.I.A.

PRESIDENT OF THE FINE ARTS FEDERATION OF NEW YORK; PAST PRESIDENT OF THE ARCHITECTURAL LEAGUE OF NEW YORK; VICE-PRESIDENT OF THE NATIONAL SCULPTURE SOCIETY; HONORARY MEMBER OF THE MURAL PAINTERS
ETC., ETC.

"Art still has truth; take refuge there!"

New York
THE MACMILLAN COMPANY
LONDON: MACMILLAN & CO., LTD.
1896

All rights reserved

COPYRIGHT, 1896,
BY THE MACMILLAN COMPANY.

66000001859
cc
Architecture 600861

Norwood Press
J. S. Cushing & Co. — Berwick & Smith
Norwood Mass. U.S.A.

PREFACE

This book is intended to show that the history of architecture is a study of absorbing interest. If the attention is fixed upon the inherent and essential peculiarities of each style, the effort of the student will be of necessity to discover the reasons for those peculiarities. Thus, in the simplest case imaginable: wherein does Gothic architecture differ from Romanesque architecture, and what are the causes of the difference? These causes are to seek in a minute comparison of the works of the Gothic and the Romanesque builders. They are to be found in actual masonry and carpentry and, in a secondary sense, in sculpture and colour-decoration. The analysis and comparison of these peculiarities, with such reference to well-established chronology as will show which pieces of building are contemporaneous and which other pieces of building follow one another closely in order of time, is certainly the most fascinating pursuit possible for all those who have the instinct of form and colour. The farther refinement of this enquiry into ethnological and anthropological research is rather for the scientifically inclined than for those to whom decorative art is the chief matter. For these last, the analysis and criticism of their beloved art itself is quite enough. A multitude of questions arise which are purely artistic

questions, and the more carefully the answers to those questions are sought, the more they are elaborated, refined upon, confirmed, verified, the more interesting does the history of architecture become.

It is to be remembered also that the subjects of this enquiry are in themselves full of interest. The buildings which we study are always singularly attractive and often of extreme beauty. The beauty is increased, and the attractiveness of the less beautiful is multiplied manyfold by minute examination into the ways in which their builders and sculptors did their work. In the study of any fine art, gain in the power of distinguishing the better from the less good is accompanied by a still increasing power of enjoying the best. It is better to sit at home with a plan and twenty photographs, with a sense of what that architecture truly means, than it is, without that sense, to visit the cathedral itself or all the cathedrals in France.

The sense of what is fine in architecture is to be gained by the study of the buildings themselves; and the more, the better. It is not too much to say, however, that a few weeks rightly spent, among the best examples and with a knowledge of what to look for, is worth many seasons of travel under other conditions. It is therefore with some confidence that this book is offered as a guide to those who would study architecture for themselves.

For those who cannot at once visit the monuments which still exist in Europe, it may be said that their position toward all European architecture is not unlike the position which the most favoured of us hold with regard to Greek and Roman architecture. Greek and

Roman monuments have perished, and their loveliness or grandeur can be appreciated only by a mental process of reconstruction. Somewhat in the same way the stay-at-home student may get much comfort out of photographs accompanied by trustworthy plans. To such students, also, this book is offered as a help in the interpretation of their photographs.[1]

It is claimed that study of ancient architecture has been the ruin of modern architectural design. There are other reasons than this, why architecture is not, at the close of the nineteenth century, a living fine art; but it

[1] It is well to state that among the photographs available for students are to be included the plates and cuts made from the originals by photographic process and which illustrate many recent works. Such works are: Barock- und Rococo-Architektur, by *R. Dohme.* Denkmaeler Deutscher Renaissance, by *K. E. O. Fritsch.* Die Holzarchitektur Deutschlands vom XIV-XVIII Jahrhundert, by *Carl Schaefer.* Architectur der Niederlande, by *L. Krook.* Motive der Mittelalterlichen Baukunst in Deutschland, by *Hugo Hartung.* Baudenkmaeler in Grossbritannien, by *C. Uhde.* Architecture of the Renaissance in England, by *J. A. Gotch* and *W. T. Brown.* London Churches of the Seventeenth and Eighteenth Centuries, by *G. H. Birch* (includes St. Paul's Cathedral). La Normandie Monumentale et Pittoresque. La France Artistique et Monumentale, by *M. H. Havard* and others. Die Baukunst Frankreichs, by *C. Gurlitt.* L'Art Gothique, by *L. Gonse.* Die Baukunst Spaniens, by *Max Junghaendel.* Baudenkmaeler in Spanien und Portugal, by *C. Uhde.* Die Architektur der Renaissance in Toscana, begun by a society in Florence, carried on by *C. von Stegmann.* Palast-Architektur von Ober-Italien und Toscana, by *R. Reinhardt* and others (especially the volumes on Genoa and Venice). Raccolta delle Vere da Pozzo in Venezia, published by *F. Ongania* (contains many views of courtyards). La Basilica di San Marco in Venezia, published by *F. Ongania* (includes several hundred photographic plates of details, which form the most important part of the work).

Some of these works consist almost wholly of plates with but little text; others have half-tone cuts scattered through the text and which cannot be separated from it.

is also true that archæological study has been unfavourable to the growth of natural and original design. This, however, is because the modern student of architecture as an art to be practised, has studied the superficial aspects of ancient styles rather than the essential nature of those styles. Our pseudo-Gothic churches and our pseudo-Roman colonnades would be alike unknown if it had been the true nature of second century and thirteenth century art which had interested the designer and absorbed his attention, in place of the mere exterior details which are so easy to copy. It is to be urged as a remedy for the modern disease of borrowing and copying, that the true nature of each favourite style of ancient art should be made more familiar to our practising architects and their draughtsmen.

August, 1896.

TABLE OF CONTENTS

INTRODUCTION

PAGE

ARCHAIC AND PREHISTORIC BUILDING xix

CHAPTER I

GRECIAN ARCHITECTURE

SECTION

I. The Archæology of the Subject 1
II. Doric Buildings 3
III. Ionic Buildings 22
IV. Corinthian Buildings 29
V. Architectural and Figure Sculpture 36
VI. Exceptional Buildings 42
VII. Polychromy 45
VIII. Dwellings 45
IX. Buildings for Amusement and Ceremony. Tombs . . . 46
X. Picturesqueness and Simplicity 48

CHAPTER II

ROMAN IMPERIAL ARCHITECTURE

I. Buildings of Solid Masonry 51
II. Cut Stone with Solid Masonry 66
III. Columnar Buildings 71
IV. Triumphal Arches 85
V. Other Memorial Structures 89
VI. Architectural Details 92
VII. Buildings of Exceptional Style 96

SECTION PAGE
VIII. The "Five Orders" 101
IX. Architectural Sculpture 105
X. Architecture of Interiors 107
XI. Economy of Roman Building 108
XII. Dwellings 109
XIII. Theatres, Circuses, etc. 110

CHAPTER III

The Architecture of Europe, 350 to 750 A.D.

I. Building under New Conditions 112
II. Early Christian Churches 119
III. Inferior Materials and Skill 128
IV. Byzantine Building 136
V. Byzantine Decoration 143

CHAPTER IV

The Architecture of Europe, 750 to 1150 A.D.

I. Northern Churches before 1150 A.D. 147
II. The Development of Vaulting 154
III. Resulting Architectural Forms 175
IV. Later Byzantine Buildings 181

CHAPTER V

Architecture of Western Europe, 1150 to 1300 A.D.

I. Origin of Gothic: France 186
II. Provinces, North and South of France 223
III. Germany 226
IV. England 235
V. Italy 245

CHAPTER VI

ARCHITECTURE OF WESTERN EUROPE, 1300 TO 1420 A.D.

SECTION		PAGE
I.	France	260
II.	Provinces, North and South of France	278
III.	Germany	286
IV.	England	296
V.	Italy	307

CHAPTER VII

ARCHITECTURE OF WESTERN EUROPE, 1420 TO 1520 A.D.

I.	France	327
II.	Provinces, North and South of France	348
III.	Germany	354
IV.	England	357
V.	Italy	365

CHAPTER VIII

ARCHITECTURE OF WESTERN EUROPE, 1520 TO 1665 A.D.

	Prefatory Note	389
I.	France	391
II.	Provinces, North and South of France	417
III.	Germany	426
IV.	England	437
V.	Italy	450

CHAPTER IX

ARCHITECTURE OF WESTERN EUROPE, 1665 TO 1789 A.D.

	Prefatory Note	474
I.	France	476
II.	Provinces, North and South of France	497
III.	Germany	504
IV.	England	516
V.	Italy	538
GLOSSARY		547
INDEX		565

LIST OF ILLUSTRATIONS IN THE TEXT

ABBREVIATIONS

Archives: Archives de la Commission des Monuments Historiques. *Art pour Tous:* Periodical of that Name. *O. H. B.:* Otto H. Bacher. *Billings' Carlisle:* Architectural Illustrations of Carlisle Cathedral, by R. W. Billings. *Billings' D. Cath.:* Architectural Illustrations of the Cathedral Church at Durham, by R. W. Billings. *Billings' D. Co.:* Illustrations of the Architectural Antiquities of the County of Durham, by R. W. Billings. *Britton:* Architectural Antiquities of Great Britain, by John Britton. *Boetticher:* Die Tektonik der Hellenen, von Karl Boetticher. *Bunsen:* Die Basiliken des Christlichen Roms, by Gutensohn & Knapp, Illustrating Bunsen's Work. *Choisy:* L'Art de Bâtir chez les Romains, par A. Choisy. *Cicogn.:* Le Fabbriche e I Monumenti Conspicui di Venezia, illustrati da L. Cicognara, etc. *Conze:* Archaeologische Untersuchungen auf Samothrake, von Alexander Conze, Alois Hauser und Otto Benndorf. *S. C.:* Sebastien Cruset. *Dartein:* Études sur l'Architecture Lombarde, par F. de Dartein. *D. & D.:* Histoire de la Sainte Chapelle du Palais, par MM. Decloux & Doury. *De G.:* Itinéraire Archéologique de Paris, par M. F. de Guilhermy. *Durelli:* La Certosa di Pavia descritta . . ., dai Fratelli Gaetano e Francesco Durelli. *Durm:* Constructive und Polychrome Details der Griechischen Baukunst . . ., von Josef Durm. *Ency.:* Encyclopédie d'Architecture (a periodical begun in 1872). *Enlart:* Origines Françaises de l'Architecture Gothique en Italie, par C. Enlart. *Entretiens:* Entretiens sur L'Architecture, par Viollet-le-Duc. *Fergusson:* A History of Architecture in All Countries, by James Fergusson. *Foerster:* Denkmale Deutscher Baukunst . . ., von Ernst Foerster. *France Artistique:* La France Artistique et Monumentale . . ., de M. Henry Havard. *Gailh.:* Monuments Anciens et Modernes, par Jules Gailhabaud. *Gailh. D. B.:* L'Art dans Les Diverses Branches . . ., par Jules Gailhabaud. *A. M. G.:* Miss Alice M. Gamble. *Gruner:* Specimens of Ornamental Art . . ., by Lewis Gruner. *Handbuch:* Handbuch der Architektur (Darmstadt, 1881, etc.). *Isabelle:* Les Édifices Circulaires et les Domes . . ., par M. E. Isabelle. *King:* The Study Book of Mediæval Architecture and Art . . ., by Thomas H. King. *Laspeyres:* Die Kirchen der Renaissance in Mittel-Italien . . ., von Paul Laspeyres. *Lenoir:* Architecture Monastique, par M. Albert Lenoir. *Le Ta.:* Édifices de Rome Moderne, par P. Le Tarouilly. *Mallay:* Essai sur Les Églises Romanes . . ., du Puy-de-Dome, par M. Mallay. *Martha:* Manuel d'Archéologie Étrusque et Romaine, par Jules Martha. *E. J. M.:* E. J. Meeker. *Prentice:* Renaissance Architecture and Ornament in Spain . . ., by Andrew N. Prentice. *Rohault:* La Toscane au Moyen Age . . ., par Georges Rohault de Fleury. *R.-R.:* L'Architecture Normande . . ., par V. Ruprich-Robert. *Salz.:* Alt-Christliche Baudenkmale von Constantinopel . . ., von W. Salzenberg. *Sauvageot:* Palais, Chateaux, Hotels, et Maisons de France . . ., par Claude Sauvageot. *Schaefer:* Die Holzarchitektur Deutschlands . . ., von Carl Schaefer. *E. H. S.:* E. H. Schutt. *Shaw:* Architectural Sketches from the Continent, by Richard Norman Shaw. *D. N. B. S.:* Danford N. B. Sturgis. *Street:* Some Account of Gothic Architecture in Spain, by George Edmund Street. *Stuart:* Antiquities of Athens . . ., by James Stuart and Nicholas Revett. *V.-le-D.:* Dictionnaire Raisonné de l'Architecture

Française . . ., par Viollet-le-Duc. *Vogüé:* Syrie Centrale; Architecture, Civile et Religieuse, par le Comte de Vogüé. *Willis:* On the Construction of the Vaults of the Middle Ages, by R. Willis [in the Transactions of the Royal Institute of British Architects for 1842].

FIG.		PAGE
1.	Athens, Theseion, plan	5
2.	Athens, Theseion, exterior. Drawn by *D. N. B. S.*	6
3.	Pæstum, Temple of Poseidon, interior. Drawn by *D. N. B. S.*	8
4.	Athens, Parthenon, plan	9
5.	Athens, Parthenon and Olympia, Temple of Zeus; two fronts on same scale	11
6.	Eleusis, Temple of Artemis, plan	12
7.	Athens, Propylaia, plan	13
8.	Athens, Propylaia, sectional perspective. Drawn by *D. N. B. S.*	14
9.	Corner of a Doric Temple. Drawn by *D. N. B. S.*	16
10.	Construction of a Doric Temple. Drawn by *D. N. B. S.*	17
11.	Athens, Doric Cap, indications of colour. Drawn by *E. H. S.*	18
12.	Outlines of Different Doric Capitals	19
13.	Ionic Capital at Athens. Drawn by *D. N. B. S.*	22
14.	Athens, Erechtheion, plan	23
15.	Athens, Erechtheion, elevation of order. Direct from *Boetticher*	26
16.	Ionic Corner Capital, plan	27
17.	Ionic Corner Capital, from within. Direct from *Durm*	27
18.	Corner of an Ionic Temple. Drawn by *D. N. B. S.*	28
19.	Athens, Lysikrates' Monument. Drawn by *D. N. B. S.*	31
20.	Athens, Lysikrates' Monument, restoration of top. Direct from *Stuart*	32
21.	Epidauros, Corinthian Capital. Drawn by *D. N. B. S.*	33
22.	Corinthian Capital. Direct from *Boetticher*	34
23.	Corinthian Capital. Direct from *Boetticher*	34
24.	Samothrace, the Arsinoeion. Direct from *Conze*	35
25.	Athens, Erechtheion, Caryatid Portico. Drawn by *D. N. B. S.*	39
26.	Athens, Throne in Theatre. Direct from *Handbuch*	40
27.	Akragas, Temple of Zeus, plan	43
28.	Rome, Pantheon, interior. Direct from *Isabelle*	57
29.	Rome, Thermæ of Caracalla, interior. Drawn by *E. H. S.* after *Viollet-le-Duc*	62
30.	Rome, S. M. degli Angeli, interior. Drawn by *S. C.*	64
31.	Nîmes, Nymphæum, interior. Drawn by *D. N. B. S.*	67
32.	Nîmes, Nymphæum, detail. Direct from *Choisy*	68
33.	Musmiyeh, Pretorium, interior. Direct from *Vogüé*	69
34.	Rome, Trajan's Forum and Basilica Ulpia, restored plan	72
35.	Cori, So-called Temple of Hercules, front. Direct from *Gailh.*	74
36.	Nîmes, Maison Carrée. Direct from *Martha*	75
37.	Baalbek, Temple of Jupiter, plan	76

FIG.		PAGE
38.	Baalbek, Temple of Jupiter, interior. Drawn by *D. N. B. S.*	78
39.	Palmyra, Part of Great Colonnade. Drawn by *D. N. B. S.*	82
40.	Restoration of Roman Temple with Portico. Direct from *Entretiens*	84
41.	Saint Chamas, Roman Bridge, with two arches. Drawn by *D. N. B. S.*	86
42.	Benevento, Arch of Trajan. Drawn by *D. N. B. S.*	88
43.	Saint Remy, Monument. Drawn by *D. N. B. S.*	91
44.	Rome, Theatre of Marcellus, detail. Direct from *Entretiens*	93
45.	Rome, Arch of Constantine, detail. Drawn by *D. N. B. S.*	95
46.	Saintes, Roman Gateway. Drawn by *D. N. B. S.*	97
47.	Athens, Arch of Hadrian. Drawn by *D. N. B. S.*	98
48.	Lambese, Pretorium. Drawn by *D. N. B. S.*	99
49.	Spalato, Palace of Diocletian, arcade. Drawn by *D. N. B. S.*	100
50.	Composite Capital. Drawn by *D. N. B. S.*	102
51.	Capital with Figure, Lateran Museum. Drawn by *D. N. B. S.*	103
52.	Capital with Rams, Lateran Museum. Drawn by *D. N. B. S.*	104
53.	Composite Ionic Capital from Temple of Saturn. Drawn by *D. N. B. S.*	104
54.	Panel of Leafage, Lateran Museum. Drawn by *D. N. B. S.*	105
55.	Kalb Louzeh, Interior of Church. Direct from *Vogüé*	114
56.	Deir Siman, Triumphal Arch. Direct from *Vogüé*	116
57.	Serjilla, Two Columns from the Church. Direct from *Vogüé*	117
58.	Kalat Siman, Apse of Church. Direct from *Vogüé*	118
59.	Rome, Basilica of S. John Lateran, plan	122
60.	Rome, Basilica of S. Clemente, interior. Direct from *Bunsen*	123
61.	Rome, Church of S. Costanza, plan	126
62.	Rome, Church of S. Costanza, interior. Direct from *Isabelle*	125
63.	Nocera, Church of S. M. de la Rotonda. Direct from *Isabelle*	127
64.	Rome, Basilica of S. Lorenzo Fuori le Mura, interior. Direct from *Bunsen*	129
65.	Biella, Chapel. Direct from *Dartein*	133
66.	Montmajour, Chapel. Direct from *V.-le-D.*	135
67.	Cividale, Church of S. M. in Valle, interior. Direct from *Gailh.*	137
68.	Constantinople, Church of H. Sophia, plan	139
69.	Constantinople, Church of H. Sophia, section. Direct from *Salz.*	141
70.	Aix-la-Chapelle, Chapel, plan. Direct from *Dartein*	148
71.	Saint Saturnin and Querqueville, plans of chapels. Direct from *Lenoir*	149
72.	Vignory, Church, plan. Direct from *V.-le-D.*	150
73.	Vignory, Church, interior. Drawn by *A. M. G.*	150
74.	Clermont-Ferrand, Church of N. D. du Port, section. Direct from *V.-le-D.*	152
75.	Poitiers, Baptistery. Direct from *Archives*	153
76.	Clermont-Ferrand, Church of N. D. du Port, plan. Direct from *Mallay*	154

FIG. PAGE

77. Clermont-Ferrand, Church of N. D. du Port, vaulting of choir-aisle. Direct from *V.-le-D.* 155
78. Clermont-Ferrand, Church of N. D. du Port, plan of vaults. Drawn by *E. H. S.* 156
79. Périgueux, Church of S. Front, plan. Direct from *Handbuch* . . 157
80. Périgueux, Church of S. Front, interior. Drawn by *E. H. S.* after *Gailh.* 158
81. Diagrams of Vaulting. Drawn by *E. H. S.* 159
82. Vézelay, Abbey Church, aisle. Drawn by *D. N. B. S.* 161
83. Diagrams, plan and undersurface of vaulting. Drawn by *E. H. S.* 162
84. Diagrams, plan and undersurface of vaulting. Drawn by *E. H. S.* 163
85. Diagram of Vaulting. Direct from *V.-le-D.* 164
86. Diagram, plan of vaulting. Drawn by *E. H. S.* 164
87. Diagram, plan of vaulting. Drawn by *E. H. S.* 165
88. Romanesque Vaulting, view. Drawn by *E. H. S.* 166
89. Diagram of Vaulting. Drawn by *E. H. S.* 167
90. Milan, Church of S. Ambrogio, partial section. Direct from *R.-R.* . 168
91. Pavia, Church of S. Michele, one bay of nave. Direct from *R.-R.* . 169
92. Spires, Cathedral, two bays of nave. Direct from *Gailh.* . . . 171
93. Vézelay, Abbey Church, nave. Drawn by *D. N. B. S.* . . . 173
94. Peterborough, Cathedral, partial plan. Direct from *R.-R.* . . 175
95. Peterborough, Cathedral, interior. Drawn by *E. J. M.* . . . 176
96. Tournai, Cathedral, group of towers. Drawn by *S. C.* . . . 177
97. Durham, Cathedral, Galilee. Direct from *Billings' D. Cath.* . . 179
98. Arles, Church of S. Trophime, cloister. Direct from *V.-le-D.* . . 180
99. Vendôme, Tower of Church. Direct from *V.-le-D.* 182
100. Vernouillet, Tower of Church. Direct from *V.-le-D.* . . . 183
101. Constantinople, Church of Theotokos, plan. Direct from *Salz.* . 184
102. Constantinople, Church of Theotokos, elevation. Direct from *Salz.* . 185
103. Diagram, plan of vaulting. Drawn by *E. H. S.* 187
104. Romanesque Vault. Direct from *V.-le-D.* 188
105. Diagram of Vaulting. Drawn by *E. H. S.* 189
106. Skeleton of Vaulting Ribs. Drawn by *E. H. S.* 189
107. Rib and Shell of Gothic Vault. Drawn by *E. H. S.* 191
108. Skeleton of Vaulting Ribs. Direct from *V.-le-D.* 193
109. Scheme of Shell of Gothic Vault. Direct from *V.-le-D.* . . . 193
110. Scheme of Shell of Gothic Vault. Direct from *V.-le-D.* . . . 194
111. Diagram Plan, sexpartite vault. Drawn by *E. H. S.* . . . 194
112. Skeleton of Ribs, sexpartite vault. Direct from *V.-le-D.* . . . 195
113. Diagram, alternative arrangement of vaulting spaces. Drawn by *E. H. S.* 196
114. Diagram, two pointed arches. Drawn by *E. H. S.* 197

FIG.		PAGE
115.	Diagram plan, Gothic church without aisles. Drawn by *E. H. S.*	198
116.	Diagram, flying buttress construction. Drawn by *E. H. S.*	199
117.	Reims, Church of S. Remy, buttress system. Direct from *King*	200
118.	Soissons, Cathedral, interior of S. transept. Direct from *V.-le-D.*	203
119.	Diagram, comparative sections. Drawn by *E. H. S.*	204
120.	Noyon, Cathedral, plan. Direct from *V.-le-D.*	206
121.	Noyon, Cathedral, interior. Drawn by *E. J. M.*	208
122.	Paris, Sainte Chapelle, exterior. Direct from *D. & D.*	212
123.	Reims, Cathedral, window. Direct from *V.-le-D.*	214
124.	Paris, Sainte Chapelle, one bay. Direct from *V.-le-D.*	216
125.	Paris, Cathedral, gable. Direct from *V.-le-D.*	217
126.	Paris, Cathedral, N. door of W. front. Direct from *V.-le-D.*	218
127.	Scheme of a Gothic Cathedral. Direct from *V.-le-D.*	220
128.	Reims, Restoration of House of the Musicians. Direct from *V.-le-D.*	224
129.	Magdeburg, Cathedral, interior of choir. Drawn by *E. J. M.*	228
130.	Magdeburg, Cathedral, doorway. Drawn by *E. J. M.*	230
131.	Trèves, Church of Liebfrauen Kirche, plan. Direct from *Gailh.*	231
132.	Freiburg, Minster, two bays of S. flank. Direct from *King*	234
133.	Lincoln, Cathedral, plan of choir vaulting. Drawn by *E. H. S.*	240
134.	Lincoln, Cathedral, plan of nave vaulting. Drawn by *E. H. S.*	241
135.	Lincoln, Cathedral, view of nave vaulting. Drawn by *E. J. M.*	242
136.	Carlisle, Cathedral, part of N. choir aisle. Direct from *Billings' Carlisle*	244
137.	Salisbury, Cathedral, tomb of Bishop Giles. Direct from *Gailh.*	246
138.	Fossanova, Chapter-House. Drawn by *E. J. M.*	248
138 A.	Fossanova, Refectory. Drawn by *E. J. M.*	249
139.	Santa Maria d' Arbona. Drawn by *E. J. M.* after *Enlart*	251
140.	Florence, Church of S. Maria Novella, nave. Drawn by *E. J. M.*	253
141.	Verona, Church of S. Anastasia, one bay. Drawn by *D. N. B. S.* after *Gruner*	255
142.	Verona, Church of S. Anastasia, exterior. Drawn by *D. N. B. S.*	256
143.	Assisi, Church of S. Francesco, one bay. Direct from *Gailh.*	258
144.	Rouen, Church of S. Ouen, plan. Direct from *V.-le-D.*	261
145.	Carcassonne, Cathedral, N. front. Direct from *France Artistique*	265
146.	Reims, Cathedral, window of nave. Direct from *V.-le-D.*	267
147.	Paris, Cathedral, window of chapel. Direct from *V.-le-D.*	269
148.	Troyes, Church of S. Urbain, diagram of window tracery. Direct from *V.-le-D.*	270
149.	Carcassonne, Cathedral, window. Direct from *V.-le-D.*	272
150.	Rouen, Cathedral, pierced gable of N. transept door. Direct from *V.-le-D.*	274
151.	Chateaudun, Front and plan of house. Direct from *V.-le-D.*	277

FIG. PAGE
152. Troyes, Chapel of S. Gilles, detail of framing. Direct from *V.-le-D.* 279
153. Toledo, Cathedral, plan of apse. Direct from *Street* . . . 280
154. Toledo, Cathedral, outer aisle of choir. Drawn by *E. J. M.* . . 281
155. Vilvorde, Church, plan. Direct from *King* 283
156. Vilvorde, Church, section. Direct from *King* 284
157. Antwerp, Cathedral, section. Direct from *King* 285
158. Oppenheim, Church of S. Katharine, detail of S. flank. Direct from *Foerster* 287
159. Nuremburg, Church of S. Sebaldus, E. end. Direct from *Foerster* . 289
160. Erfurt, Cathedral, plan. Direct from *King* 291
161. Erfurt, Cathedral, exterior. Direct from *King* 292
162. Vienna, Cathedral, plan. Direct from *Foerster* 293
163. Lincoln, Cathedral, central tower. Direct from *Britton* . . . 297
164. Beverley, Minster, one bay, exterior and interior. Direct from *Britton* 299
164 A. Carlisle, Cathedral, E. window. Direct from *Billings' Carlisle* . 300
165. Staindrop, Church, choir. Direct from *Billings' D. Co.* 302
165 A. Ely, Cathedral, plan of vaulting of octagon. Drawn by *E. H. S.* . 303
166. Durham, Cathedral, detail of vaulting. Direct from *Billings' D. Cath.* 305
166 A. London, Westminster Hall, roof 306
166 B. Plans of three churches compared. Drawn by *E. H. S.* . . . 308
167. Bologna, Church of S. Petronio, detail of interior. Drawn by *E. J. M.* 309
168. Florence, Cathedral, part of interior. Direct from *Gailh.* . . . 312
168 A. Lucca, Cathedral, part of interior. Drawn by *E. H. S.* after *Shaw* . 314
169. Florence, Loggia dei Lanzi, interior. Direct from *Rohault* . . 316
170. Venice, Ducal Palace, detail of façade. Direct from *Cicogn.* . . 324
171. Verona, Tomb of Mastino II. Drawn by *E. J. M.* 325
172. Paris, Church of S. Germain l'Auxerrois. Direct from *De G.* . . 329
173. Narbonne, Cathedral, detail of pier. Direct from *V.-le-D.* . . 330
174. Rouen, Church of S. Maclou, gables of porch. Drawn by *A. M. G.* . 331
175. Evreux, Cathedral, buttress. Direct from *V.-le-D.* 332
176. Narbonne, Cathedral, detail of cloister. Direct from *V.-le-D.* . . 333
177. Avioth, Chapel, plan. Direct from *V.-le-D.* 336
178. Avioth, Chapel, exterior. Direct from *V.-le-D.* 337
179. Albi, Cathedral, S. porch. Direct from *V.-le-D.* 339
180. Tours, Cathedral, central doorway. Direct from *V.-le-D.* . . 340
181. Eu, Church, pendant of vaulting rib. Direct from *V.-le-D.* . . 341
182. Troyes, Church of S. Madeleine, jubé. Direct from *Gailh.* . . 343
183. Paris, Hotel de Cluny, plan. Direct from *V.-le-D.* 344
184. Paris, Hotel de Cluny, exterior. Direct from *V.-le-D.* . . . 345
185. Rouen, Front of house. Direct from *V.-le-D.* 347
186. Valladolid, Church of S. Gregorio, cloister door. Drawn by *E. J. M.* 350

FIG. PAGE
187. Guadalajara, Courtyard of a palace. Drawn by *E. J. M.* . . . 352
188. Hanover, Rathhaus. Drawn by *A. M. G.* 355
189. Taunton, Church of S. M. Magdalen, tower. Direct from *Britton* . 359
189 A. Warwick, the Beauchamp Chapel. Direct from *Britton* 361
190. Oxford, Christ Church College Hall, vestibule. Drawn by *E. J. M.* . 363
191. Windsor, S. George's Chapel, vaulting. Direct from *Willis* . . 364
192. Florence, Pazzi Chapel. Drawn by *A. M. G.* 370
193. Mantua, Church of S. Andrea, plan. Drawn by *E. H. S.* . . . 372
194. Certosa, near Pavia, detail. Direct from *Durelli* 375
195. Relief Arabesque. Direct from *Art pour Tous* 376
196. Venice, Church of S. Zaccaria, front. Direct from *Cicogn.* . . 378
197. Diagram Plan, Renaissance Church. Drawn by *E. H. S.* . . 380
198. Venice, Church of S. Fantino, interior. Drawn by *S. C.* . . . 381
199. Cortona, Church of S. M. Nuova, plan. Direct from *Laspeyres* . 382
200. Montepulciano, Church of S. Biagio, plan. Direct from *Laspeyres* . 383
201. Rome, Palazzo Stoppani, front. Direct from *Le Tarouilly* . . . 387
202. Chateau of Chambord, central mass. Direct from *Gailh.* . . . 397
203. Blois, Chateau, stairway tower of François I. Direct from *Archives* 398
204. Bussy-le-Grand, Chateau, detail. Direct from *Sauvageot* . . . 399
205. Varengeville, Manoir d'Ango, detail. Drawn by *A. M. G.* . . 400
206. Rouen, Front of house. Direct from *Gailh.* 402
207. Écouen, Chateau, detail. Drawn by *A. M. G.* 403
208. Nogent-sur-Seine, Church, detail. Direct from *Gailh. D. B.* . . 405
209. Paris, Church of S. Étienne du Mont, front. Direct from *De G.* . 406
210. Paris, Church of S. Étienne du Mont, interior. Direct from *Encyc.* . 407
211. Tillières, Church, roof of choir. Direct from *Encyc.* 408
212. Tillières, Church, diagram plan. Drawn by *E. H. S.* . . . 409
213. Moulins, Hospital, part of front. Direct from *Gailh. D. B.* . . 411
214. Paris, Luxembourg, pavilion. Drawn by *E. H. S.* 413
215. Paris, Church of S. Roch, interior. Drawn by *E. J. M.* . . . 416
216. Antwerp, Church of S. Charles Borromeo, tower. Drawn by *E. J. M.* 418
217. Avila, Casa Polentina, detail. Direct from *Prentice* 421
218. Granada, Palace of Charles V., detail. Drawn by *E. J. M.* . . 423
219. Hildesheim, Wooden house. Direct from *Schaefer* 429
220. Danzig, Zeughaus, detail. Drawn by *E. H. S.* 431
221. Cologne, Rathhaus, porch. Direct from *Gailh.* 433
222. Ratisbon, Rathhaus, doorway. Drawn by *E. J. M.* 434
223. Munich, Church of S. Michael, interior. Drawn by *E. J. M.* . . 435
224. Bramshill, Manor House, detail. Drawn by *S. C.* 440
225. Wollaton House, one tower. Drawn by *E. H. S.* 442
226. Gainford Hall, doorway. Direct from *Billings' D. Co.* . . . 444
227. Moreton Old Hall, detail. Drawn by *O. H. B.* 447

FIG. PAGE
228. Venice, Palazzo Widman. Drawn by *A. M. G.* 455
229. Venice, Scuola di S. Rocco. Drawn by *S. C.* 461
230. Vicenza, Palazzo Thiene. Drawn by *S. C.* 463
230 A. Vicenza, Villa Rotonda. Drawn by *S. C.* 465
231. Rome, Church of S. Peter, partial plan. Direct from *Gailh.* . . 466
232. Rome, church of S. Peter, N. front. Direct from *Gailh.* . . . 467
233. Rome, Palazzo dei Conservatori. Drawn by *S. C.* 472
234. Versailles, Chapel of Chateau, interior. Drawn by *E. J. M.* . . 483
235. Paris, Ministère de la Marine. Drawn by *E. J. M.* 486
236. Paris, Church of the Invalides. Direct from *Gailh.* 489
237. Paris, Hôtel Soubise, interior. Direct from *Art pour Tous* . . 494
238. Paris, Hôtel Soubise, pavilion. Drawn by *E. H. S.* 495
239. Antwerp, Doorway of a court. Drawn by *E. H. S.* 497
240. Louvain, Church of S. Michael, detail. Drawn by *E. J. M.* . . 499
241. Zaragoza, Old Cathedral, tower. Drawn by *E. J. M.* . . . 500
242. Madrid, Palace, detail. Drawn by *E. H. S.* 503
243. Zurich, Town Hall, detail. Drawn by *E. J. M.* 506
244. Magdeburg, Rathhaus, detail. Drawn by *A. M. G.* 508
245. Dresden, Catholic Court Church, detail. Drawn by *E. J. M.* . . 512
246. Bruchsal Schloss, interior. Direct from *Art pour Tous* . . . 513
247. Stuttgart, Schloss, "Solitude." Drawn by *S. C.* 514
248. Munich, Street Front. Drawn by *O. H. B.* 515
249. London, Temple Bar. Drawn by *E. J. M.* 519
250. London, Church of S. Mary le Bow, steeple. Drawn by *E. J. M.* . 520
251. London, Church of S. Paul, partial section. Direct from *Gailh.* . 523
252. London, Church of S. Paul, W. front detail. Drawn by *E. J. M.* . 527
253. London, Church of S. Mary le Strand, steeple. Drawn by *E. J. M.* 532
254. London, Somerset House, vestibule. Direct from a print . . 536
255. Venice, Palazzo Grassi. Drawn by *S. C.* 540
256. Rome, Piazza di S. Pietro, colonnade. Drawn by *E. J. M.* . . 543

LIST OF PLATES

		TO FACE PAGE
I.	Angoulême: Cathedral, west front	178
II.	Salisbury: Cathedral, from the southwest	238
III.	Rouen: Church of S. Ouen, from the southeast	262
IV.	Florence: Cathedral, part of south flank	318
V.	Antwerp: Cathedral, spire	348
VI.	Louvain: Town Hall	348
VII.	Valladolid: Church of S. Pablo, west front	350
VIII.	Cambridge: King's College Chapel, interior	364
IX.	Venice: Old Library of S. Mark, part of front	456
X.	Illustrations of term "Arch" in Glossary, drawn by *E. H. S.*	548

INTRODUCTION

ARCHAIC AND PREHISTORIC BUILDING

THIS book is devoted to the study of those ancient styles of decorative building which have most powerfully influenced later styles, and to those later styles themselves; down to the present epoch, in which no style prevails. It is a brief sketch of the history of European architecture, of its often repeated progress and decline, and of a new progress and decline in the fifteenth and following centuries which were in many ways unique. The record begins with the Greek buildings of Doric style; but there are some few vestiges of earlier ways of building and of adorning buildings which must be mentioned.

Architecture is what is known as a *decorative art*; that is, it consists in applying fine art to certain objects of utility — in this case to buildings. Therefore mere rough walls used for enclosure, or to retain and support loose earth, massive and permanent military buildings, roads and bridges, however skilfully and well built, are not architecture in the strict sense. When we have no other remains of a lost civilization, we have to study such rough

and unarchitectural remains. These forgotten styles of building, however, have had little immediate influence on later architecture, so far as can be traced.

Near the eastern shore of the Morea are two low hills on the tops of which have been discovered extensive ruins. These have been identified with the ancient Greek cities Tiryns and Mykenai, the latter of which we know from Homer as the capital of Atreus and Agamemnon, and the former as the still older and more mythical city of Perseus. Both these towns existed still in the historical era, as unimportant towns, but the vestiges on the hilltops are of an epoch far older than even the early days of Peisistratos or of Solon. We are left to suppose that in each case the later city was built in the plain or on the lower hillsides, while the ancient fortress remained the citadel, its palace-interior perhaps dismantled, but its defences kept in condition. Both cities were deserted in the fifth century B.C. The ruins have been studied, those of Tiryns with especial care and knowledge, and much that is curious has been well established, although there is much more that might be done if money could be had for further exploration.

At Tiryns a castle, built with walls of prodigious thickness and a very elaborate system of flanking projections and angles for better defence, contained a series of halls, rooms, passages, and stately gateways, the whole forming such a palace as a king of the Homeric poems might well have possessed. Traces of columns, probably wooden ones, show where the roof of a large room was supported, and a fire-hearth in the middle, taken in connection with

those posts, shows where a raised part of the roof must have let off the smoke through louvres. A heavy threshold still in place shows, by the round holes in it and the marks of swinging doors, that those doors were supported by pivots at top and bottom and not hung on hinges.

At Mykenai, and at other points in Greece, are several round chambers roofed, or rather closed at top, by means of courses of stone successively overlapping one another, and projecting inward; corbelled out, as modern builders say; each ring of stones smaller than the one below, and the uppermost ring covered by a single stone. These are all meant to be buried in the earth; they have therefore no exterior design, no walls, only a decorative doorway to which a narrow passage leads. The largest of these has been known for centuries; it is the so-called "Treasury of Atreus"; and, like the others, is undoubtedly a tomb. Such structures are found also in Italy, in islands of the Mediterranean, in Scotland and the Scottish islands, and in Mexico; they are not in themselves important to students of architecture; but the great Mykenai tomb chamber is nearly fifty feet in diameter, and fragments of a once rich architectural doorway point to a developed and decidedly Asiatic style of decoration. With this structure is to be associated a lining or interior ornamentation of some material once held in place by nails whose holes may be seen; it is generally thought to have been bronze. The famous Gate of the Lions, not far away, and affording entrance to the enclosure of the Acropolis, is probably later, though still very early in date. In the Tiryns ruins fragments of blue glass im-

bedded in marble slabs have been found. All the evidence points to an architecture richer in ornament than in constructive design; the building rude, but the added ornament rich.

In Northern Italy are found remains of large mounds, cased outside, wholly or in part, with cut stone. Within, these may be mere chambers like those treated of above, or still more simple and faced with a few large slabs; but without they have had some monumental character. Buildings of this character, and evidently meant for tombs, are found in Asia Minor and in Algeria, and on a gigantic scale in India, where they are the prototypes of the splendid "pagodas" of later times; but those of Tuscany and Umbria are peculiarly important to us, because of their connection with Roman tombs of the great imperial epoch. These buildings we associate with the Etruscans or Etrurians, the people of Etruria, who governed all Italy from the Tiber to the Po, and at one time held the city of Rome in subjection. Their language cannot be read by moderns; no complete building nor even any extensive ruin of theirs remains; we have only movables, such as bronze lamps and mirrors and jewelry, stone and terra-cotta coffins and urns; and, of building, fragments of fortress wall, tombs and gateways, and one or two structures in the city of Rome itself. Among those rough and unarchitectural structures there is one element introduced which is of surpassing importance to all subsequent time, the true arch built of radiating voussoirs. This way of covering-in a chamber or a passage, or spanning a doorway, was known to the people of a remote antiquity

in Egypt and in Western and Eastern Asia, but the people who built what we call Etruscan buildings were the first to use it commonly in Europe. Their gateways of fortified cities remain at Perugia and Volterra, and the famous sewer which drained the Roman Forum, the Cloaca Maxima, was of the time of the semi-Etruscan Roman kings. Their temples have gone, and of them only the account by Vitruvius remains. His work tells us that a great deal of wood was used in their construction; that practically only the substructure and the columns were of stone; that they were often built with three chambers side by side in the cella, with a portico across the fronts of the three, — making a structure nearly square. Buildings of that type undoubtedly existed in Rome even in the great days of the Empire, but the Roman temples were not the most characteristic nor the most successful Roman buildings, and, moreover, the Greek influence prevailed over the Etruscan in that as in other things.

Thousands of hillsides and of riverbanks have seen the buildings of half-barbarous people rise and fall again, with no result except the piles of ruin in which later, not more civilized people quarry. Once, only, in a series of centuries, appears an architectural thought destined to grow great and stimulate other thoughts and call out their embodiment in visible form. Such a beginning was made in Egypt we do not know when, — perhaps five thousand years before our era, — and this was great and prevailed mightily for an incredible length of time. Such a beginning must have been in the lowlands along the Euphrates and the Tigris, perhaps as early as the African one. In

a different way, such another must have taken shape along the Hwang-ho, we may yet learn at what period of early history. But the one commencement of constructional art which is the most important to us was much more recent. Somewhere in Grecian lands, about seven hundred years before our era, such a beginning of architecture was made; two centuries and a half later this had grown into the Grecian architecture which we admire; from this it came to pass that Roman building was what it was, and from Roman building has come all that of later Europe.

CHAPTER I

GRECIAN ARCHITECTURE FROM ABOUT 600 B.C. TO THE ROMAN CONQUEST; EXISTS IN ALL LANDS INHABITED BY GREEKS, FROM ASIA MINOR TO SICILY. DORIC, IONIC, AND CORINTHIAN STYLES; THE LAST NAMED NOT FULLY DEVELOPED BY THE GREEKS.

I

IN the seventh and following centuries B.C. the people who called themselves Graikoi and Hellenes, and whom the Romans called Græci, occupied what is now the kingdom of the Hellenes, or Greece as we call it in English, and also some part of what is now Turkey in Europe. Colonies of these people were in possession also of much land on the neighbouring seacoasts, and in some of these places so many Greeks had come as immigrants, or had been born of immigrants, that the whole populace must have seemed Greek to a visitor. Such colonies held most of the western coast of Asia Minor; in Italy the coast on the Gulf of Taranto, that of the little peninsula nearest to Sicily, now called Calabria, and many other isolated places on the eastern and western coasts; and in Sicily practically all the coast except some parts of the northern shore. Besides these possessions the Greeks controlled Crete and Rhodes and the small islands of the Archipelago; and they generally held a predominating influence in Cyprus.

In all these countries ruins of Greek buildings and remains of Greek art have been found, and more are found every year. The buildings are all more or less ruinous; they have lost their sculptures, except for a few shattered fragments, and they have lost, except for a few faint traces, the painting in vivid colours which was a part of their decoration. But there is a universal agreement among students of art that this architecture of the Greeks was most beautiful and worthy to be studied. From the sixteenth century there have been travellers who have brought back to western Europe some account of what remained of it. In 1762, James Stuart and Nicholas Revett published in London the first volume of a great book on the Antiquities of Athens; two or three less elaborate studies had preceded this, and scholars in western Europe then began to feel that there was a noble architecture which had remained unknown to them. In 1811 the Earl of Elgin brought from Athens those sculptured stones of the Parthenon, the Erechtheion, and other ancient buildings at Athens which are now in the British Museum. The science of archæology, that is the study of the remains of ancient art and building and the like in a thorough way, may be said to have begun with the writings of Johann Joachim Winckelmann, who died in 1768.

The Greek remains have been studied in a more and more serious fashion as this science of archæology has been more developed and perfected. A great deal of money and labour has been devoted to digging and exploration, and also to careful measurements and minute study of what has been found. Some of the explorations will be

mentioned in this book. There are at Athens, the capital of modern Greece, four schools of archæological study, kept up by the French government, the German government, and by societies in the United States and in England. Very many books on this subject, some of them very large folios of plates, have been published; and photographs by thousands have been made of Greek remains of all sorts. Casts of sculptures and of architectural fragments have been made and distributed among museums all over Europe and America. Many periodicals are issued, devoted wholly or in part to Greek architecture and art. Many of the great universities and colleges have professorships and whole departments of study of these same subjects. And there is a constant discussion going on concerning all those points which are doubtful or disputed.

II

The best preserved early Greek buildings which remain to us, except three which will be separately described, are oblong rectangular structures one story high, having many columns which form a portico at one end, or porticoes at both ends, or on all sides of an inner chamber or pair of chambers. Their remains show that they each had a double-pitched roof of slight inclination, which ended in a gable at each end; such a low gable as is called a pediment. These buildings are recognized as temples dedicated to the divinities of the Greek Mythology; and inscriptions found in and near them, or the allusions of ancient writers, often enable us to say positively that such

a building is a temple of Athena, as the Parthenon at Athens; or of Zeus, as the great temple at Olympia; or of some other divinity or some hero or demigod. Now, no one of these temples is in any respect like a modern place of worship; they have but small interiors, and those interiors seem not to have been lighted by windows in any case, but only through the doorway or by lamps, except where there was a part left unroofed. It is maintained by some writers that a system of small openings was made in the slope of the roof, and by others that there were openings in low walls supported on columns within, somewhat like the clear-story windows of basilicas and Gothic churches (Ch. III., IV., V.). Some writers maintain that an open court was left, as wide as the whole space within the solid walls, and others think that the space between those walls and an inner row of columns was left unroofed. There is no evidence that any such means were used, except a sentence, hard to understand, in Vitruvius (see the Glossary), but this sentence does not say that temples were commonly lighted in any such way or in any way. It has been merely assumed that there must have been light openings, and different writers have tried to find a way in which they might have been made. The interiors were small and the need of daylight was not very great; incense may have been burned in front of the principal statue, and a score or two of persons may have been present to witness this ceremony; but the space was hardly sufficient even for these, for we know that much of it was given up to other statues, and to the display of gifts and rich treasures. Those religious ceremonies which needed

to be seen by the whole people were necessarily performed in the open air, and we know that often an altar was permanently set up in front of the temple or in some cases at one side.

A very few temples remain with all their principal columns standing and some part of their walls and of the structure once raised upon the great columns still in place. The best preserved of all is at Athens: the temple usually called that of Theseus, but probably that of Hephaistos. Figure 1 gives the plan of this building. The enclosed part (naos or cella) was only about nineteen by thirty-eight feet, and the whole length of the walls, including the two vestibules, called pronaos and epinaos, is only seventy-two feet. A portico of columns, six at each end, and thirteen on each side, including the corner ones, carries the entablature, upon which the roof once rested. Some part of the ceiling of the pteroma, or space between the naos wall and the colonnade, remains, but no part of the sloping roof. During the Middle Ages the building had been used as a church, — perhaps as a mosque, after the Turkish conquest, — and a vaulted roof had been built; also a kind of apse at the east end, of both of which additions traces remain. Still, no part of the original building except the roof can be misunderstood (see Fig. 2).

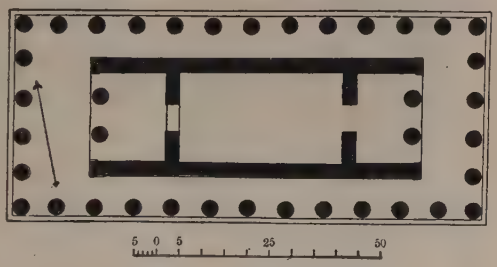


FIG. 1. Athens: so-called Temple of Theseus. Fifth century B.C. Plan.

Another temple very much like the one described above, longer by thirty feet and nearly as well preserved, is the one called temple of Concordia, near Girgenti, on the south coast of Sicily. The ruins around it are known to be those of the ancient city of Akragas, called by the Romans Agrigentum. This temple, as well as the Athenian one, belongs to the best period of the style: the period of the most graceful proportions of larger and

FIG. 2. Athens: so-called Temple of Theseus, from the northeast.

smaller parts. Another well-preserved hexastyle temple is at Pæstum, on the west coast of Italy, near Naples. This is about 190 feet long, and, like all these buildings, of proportionate width and other dimensions: it is generally called the temple of Poseidon because the town was sacred to that god, and was called by the Greek colonists Poseidonia. Another very similar, but much smaller, — not even as large as the Theseion at Athens, — and called the temple of Demeter, stands also within the walls of Pæstum.

Another is on the southern coast of Sicily, among the ruins of the ancient town of Segesta. This building had not been entirely finished when the work was interrupted; and a great deal has been learned from it about the Grecian ways of stone-cutting and building. Besides these, of which all, or nearly all, the outer screen of columns remains standing, there are at Akragas two ruined buildings of the same character, of which many of the columns still stand; one on the island of Ægina, near Athens, with twenty of its columns erect, and famous for its sculptures, which have been removed to the sculpture gallery at Munich; one on the promontory called Cape Colonna, near Athens, and known as the temple of Sunion; one at the ancient Bassai, on the west coast of the Morea, with thirty-six columns erect; one on the shore of the Gulf of Taranto, among the ruins of Metapontum; two at Syracuse, in Sicily; one, the temple of Hera, at Akragas; and, in the ruins of Selinus in Sicily, several temples, overthrown by earthquakes, but lying nearly as they fell. There have been explored and studied also, thoroughly and with great gain to our knowledge, the ruins of more completely destroyed temples at Assos on the coast of Asia Minor, and Olympia in Greece; and still other ruins have been more or less carefully examined, as at Corinth, at Nemea, southwest of Corinth, and at Taormina in Sicily.

The plan, Fig. 1, will suffice to explain the general arrangement of each and all of these temples. They differ from one another only in having one, two, or more compartments in the part enclosed by walls, in the width of the pteroma, in the spacing of the columns, in the forms of

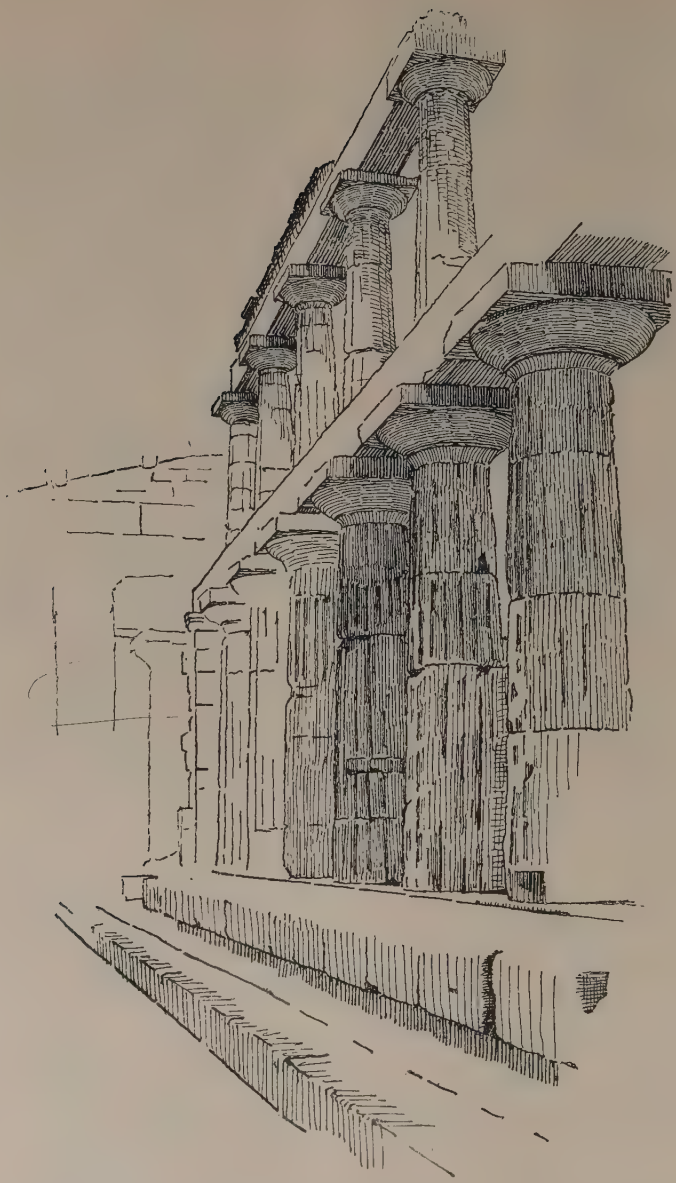


FIG. 3. Pæstum, Italy: so-called Temple of Poseidon. View of inner colonnades.

shaft and capital, and in dimensions. Greater differences may have existed, of which we cannot be sure in the present state of our knowledge of these ruins: thus the interior of the naos is known to have had two rows of columns in several of the temples, and in two or three it is certain that these colonnades were two stories high. Figure 3 shows this arrangement, as it still exists at the temple called that of Poseidon at Pæstum. This is, of all the

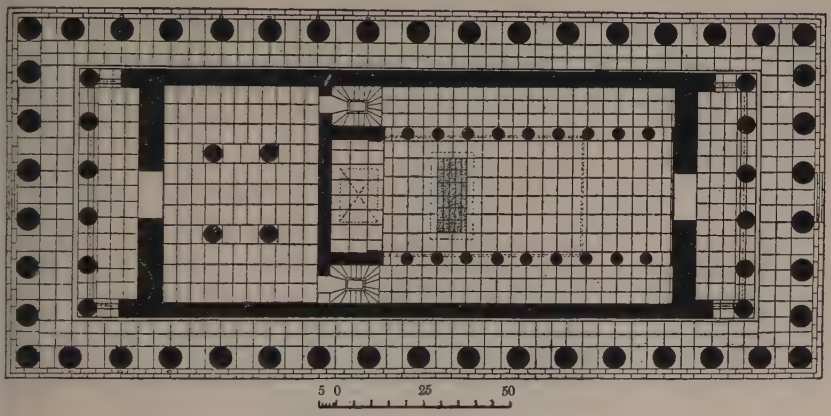


Fig. 4. Athens: Parthenon. Finished 438 B.C. Plan.

Doric temples, the one whose interior disposition is best preserved. It is peculiar in having the floor of the naos raised high above the floor of the pteroma; but in other respects the plan of the Parthenon (Fig. 4) may be consulted.

It is evident that in these buildings there are no arches, but only plain post-and-beam construction; no windows, no chimneys, and in general nothing complex or hard to understand in all the building. All the structure, the roof excepted, is made up of carefully cut stones, laid one upon

another in wall or column, or stretching across from one column to another or from column to wall. The columns, like the walls, are made of blocks laid one upon another. It is found, moreover, that no mortar has been used in any of these buildings. The stones rest in their places because of weight and friction alone, except that, as a precaution against earthquakes and to help in the original setting of the large blocks, iron or bronze cramps were often used. It appears, too, that special means were used to make the stones fit one another closely, with almost invisible joints. It is thought that the drums of the columns were revolved, one upon the other, so as to grind their surfaces smooth and uniform.

Besides these hexastyle temples a very few are known to us which have eight columns at each end, and which are therefore called *octostyle*. The best preserved of these is the celebrated Parthenon at Athens. Figure 4 gives the plan of this temple, and Fig. 5 an outline elevation of one end of it compared with a similar elevation of the temple of Zeus at Olympia, that the reader may note how the carefully considered proportions of the hexastyle temple were at once abandoned when an octostyle temple was decided on. In all minor proportions, and in the proportion of length to width, there is no change, and the usual minute care is observed, but no attempt seems to have been made to allow for or accommodate the design of the fronts or ends of the temple to this addition of one-third to the width. It seems probable that the general mass of the Parthenon was, therefore, less perfect in the relations of width to other dimensions. The great temple at the

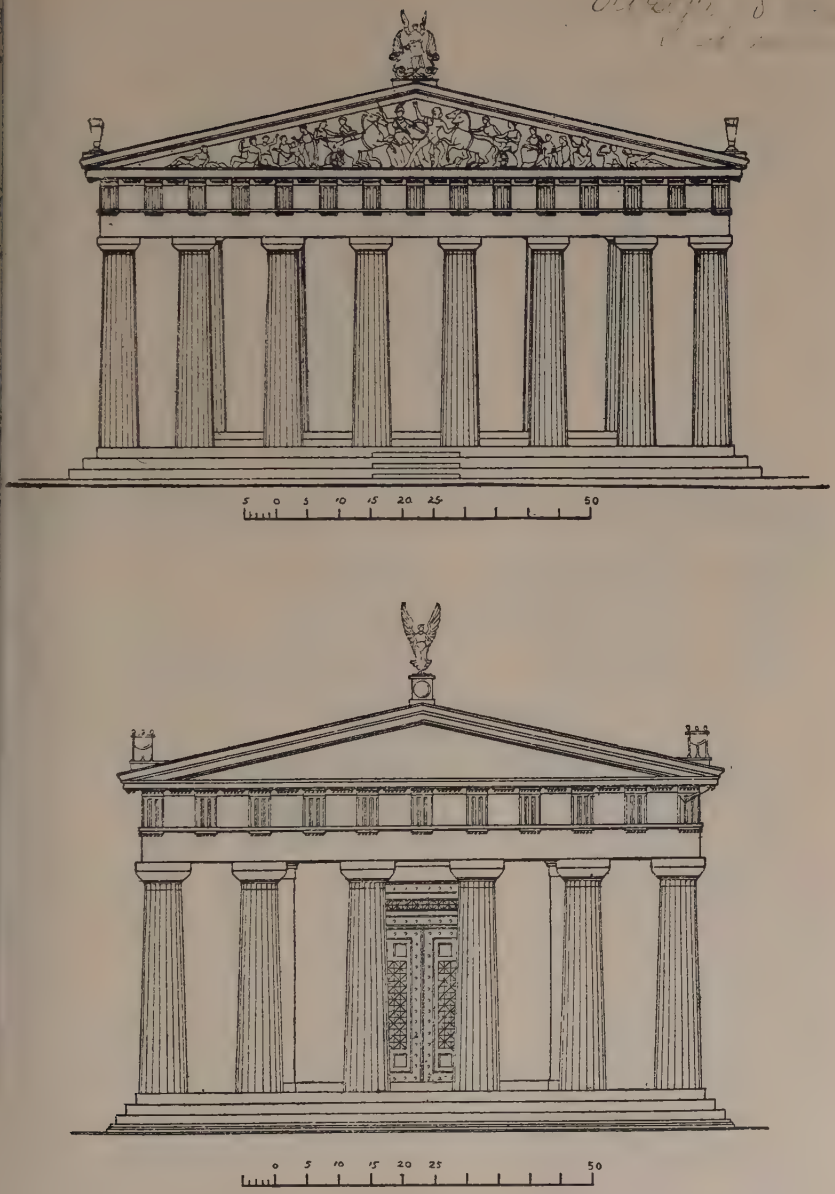


FIG. 5. Athens, Parthenon; and Olympia, Temple of Zeus. Each of the fifth century B.C. Elevations on the same scale.

ancient Selinus, mentioned above, was another octostyle structure. It may have been even more excessively broad, in appearance, than the Parthenon, for the space between the columns and the wall of the naos is very wide. A temple arranged in this way is called *pseudodipteral*. The little temple at Eleusis, thought to be that of Artemis (see Fig. 6), is of the form called *distyle in antis*.

A very few buildings are known to us which were certainly or probably not temples but which are like the temples in the style of the columns, the entablatures, and other details. One of these is the singular and puzzling building at Pæstum, having nine columns at each end. This seems not to have had a naos; in place of a naos wall are inner rows of columns, with square pillars at the four corners, enclosing a space which may have been screened by low walls between the columns. And a third row of columns divides it lengthwise. It is called the Basilica (Ch. II.) because it seems to have been a portico for walking in shelter—a covered promenade. Another is the Telesterion at Eleusis. Little is known of this but its ground plan, and the recorded fact that it was used for the initiation of persons into the mysteries of Eleusis. It was dodecastyle, but not peripteral; that is, it had columns in front, twelve in one portico, but none on the sides nor rear. Another such building is the little known colonnade at Porto Mandri, in Attica, among the ruins of the ancient Thorikos. Still another is the round building at Samothrace called the Arsinoeion; and most unusual and curious

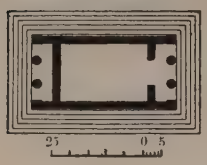


FIG. 6. Eleusis: so-called Temple of Artemis. Plan.

of all is the round building (Tholos) at Epidauros, on the eastern coast of the Morea, in which it appears that a complete circular portico of twenty-six Doric columns sur-

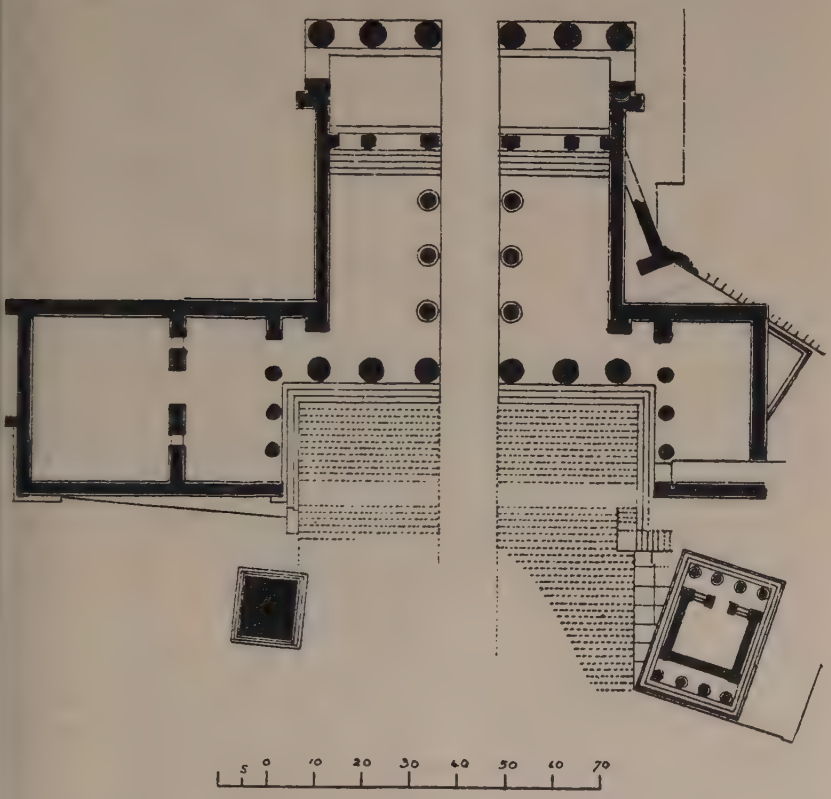


FIG. 7. Athens: Propylaia of Acropolis. 437 to 432 B.C. Plan.

rounded a circular sekos, or enclosed chamber. Of these buildings it will be necessary to speak when we are considering the Grecian Corinthian style (see p. 30).

Another and a most important building of this class is the gateway structure or Propylaia of the Acropolis at

Athens (see Figs. 7 and 8). A hexastyle portico facing westward is flanked by two lower and smaller porticoes of only three columns each, which project about twenty-five feet toward the west. Behind these smaller porticoes are rooms of no very elaborate architecture, forming wings to the main structure, and a door in the southern wing leads out upon the high platform where stands the temple

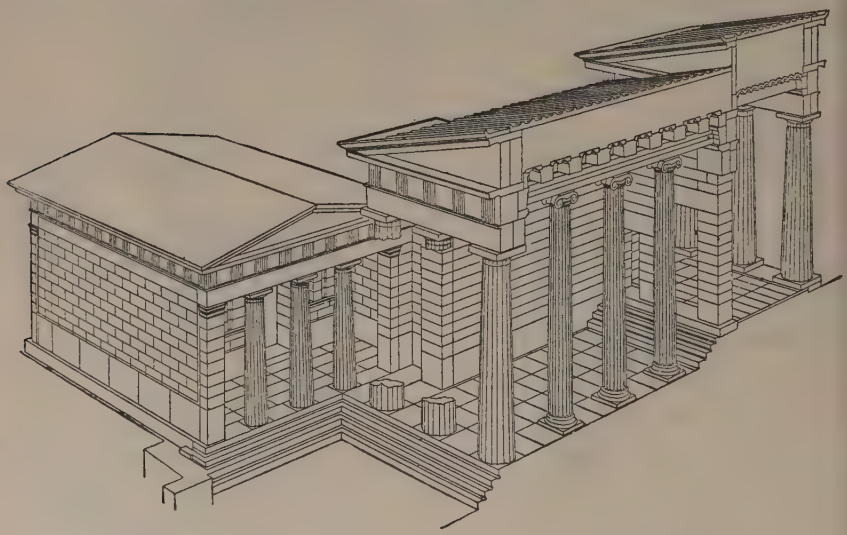


FIG. 8. Athens: Propylaia of Acropolis. Sectional perspective.

of Athena Nike, which will be described in the next section. All the three porticoes face upon the ancient approach to the Acropolis. Foot-passengers who had reached the top of the rocky ascent stepped upon the lowest of three marble steps which formed the stylobate. Four-footed creatures, and the wagons or carts drawn in procession or otherwise, passed through the central and wider intercolumniation, where the rock was

left bare in a continuous roadway. This roadway sloped steadily uphill toward the east, and the foot-passengers passing through the Propylaia had to ascend five steps more before reaching doorways pierced in a solid wall and passing out through these into the eastern portico, almost exactly like the main western portico, though on a higher level. Six columns of a different pattern from the rest, nearly like those inside the temple of Bassai (p. 7), separate the central roadway from the raised floor of the portico on each side of it. (See the next section for the account of these *Ionic* columns.)

Figure 9 shows three columns and the entablature upon them of one of these buildings. Beginning at the bottom, it should be noticed that the shaft is set upon the stylobate directly, whereas all the other columns we shall have to speak of in this book have *bases*. Generally the shaft is built up of many pieces, each of the full thickness of the shaft: these nearly cylindrical masses are called *drums*. The ruins of a temple at Corinth have monolithic shafts: the columns there are of shorter and stouter proportion than others, and the temple is assumed to be the oldest of any of which considerable remains exist, and probably of the seventh century B.C. The shaft is always grooved with channels having only a sharp edge or arris between them: these channels are of a flattish curve, generally elliptical. The number of these channels is sixteen or twenty. The capital is made up of the round bell and the square abacus. Upon the abaci rest horizontal bars or lintels of stone, and these together form the epistyle or architrave. In nearly all the buildings these epistyles were left by the builders

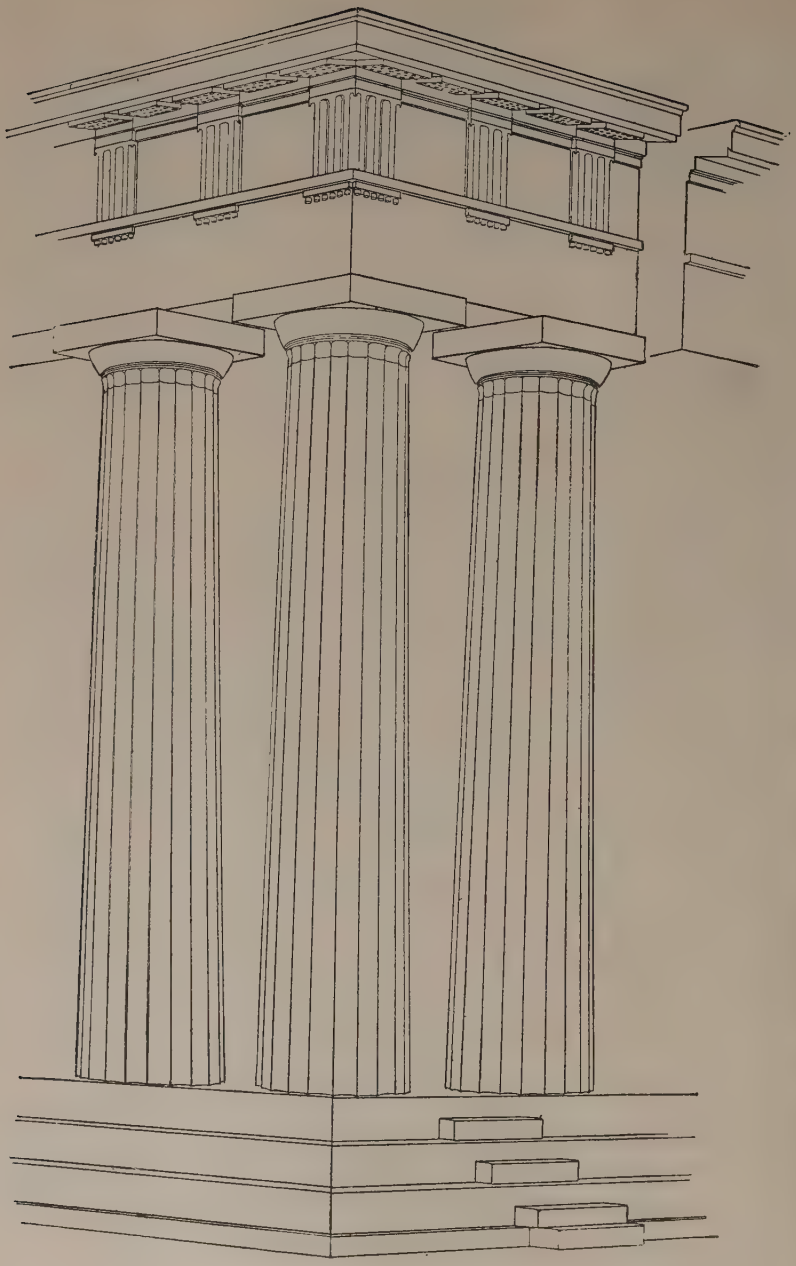


Fig. 9.

plain, as we find them, although they were often decorated afterward with bronze shields hung up, with inscriptions, and with painting. In a single known instance, the temple at Assos, the epistyle is carved. Upon the epistyle rests a second tier or layer of stone, built up in a more elaborate way: the stone blocks called triglyphs are thick, and carry the cornice and all above it, but the metopes between them are filled with thinner pieces often carved with figures and groups in high relief. It is thought that in very ancient times these metopes were left open. Upon the frieze rests the cornice, which is shaped so as to allow no water to run from it along the frieze and architrave; that is, it is cut with a drip-moulding. Figure 10

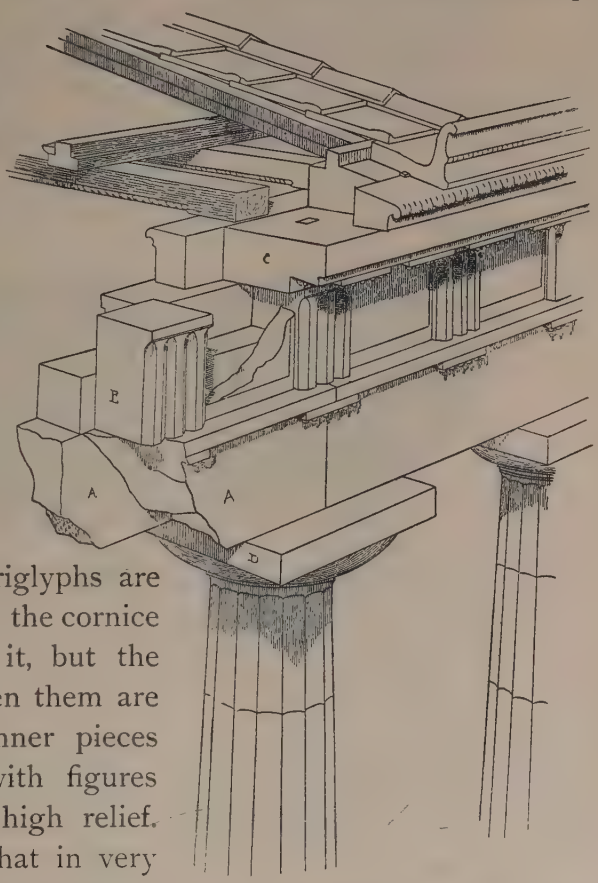


FIG. 10. *A*, Epistyle or architrave — in this case two stones in depth. *B*, Triglyph; the metopes are between the triglyphs, and the whole horizontal band is the frieze. *C*, Cornice. *D*, Abacus of the capital.

gives all the parts of the structure which are common to all these buildings.

All the buildings which have been mentioned are said to be of the Doric style of architecture. The columns with their entablature above form the Doric order; and we say that one of these porticoes is only one order high, that is, that there is only one column with its entablature in its whole height — not two or three stories of columns.

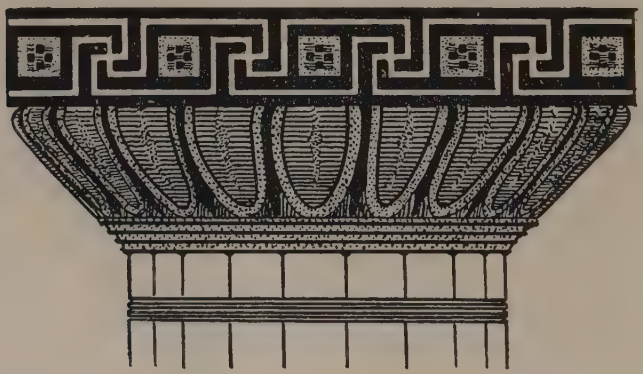


FIG. 11. Athens: Parthenon. A capital with colour indicated restored.

The particular beauty and charm of this Doric order are in the extreme refinement of its details. Every detail of the whole order was the subject of constant thought, and the designers were always modifying the section of the grooves in the triglyph and of the channels of the shafts, and of the swelling bell of the capital. The column in a special way was constantly studied and often changed. Figure 11 gives a large detail of a capital of the Parthenon, with the ornamental painting restored nearly as it must have been. The colour leaves traces behind it even

when entirely gone, so that the pattern can be seen plainly, and, moreover, the colour itself has been found in small parts. Figure 12 gives the outline, on a still larger scale, of several capitals of different buildings. It will be seen that the curve of the echinus is very deli-

Fig. 12. Profiles of Doric capitals, as follows: Nos. 1 and 6, early capitals found on Acropolis at Athens. No. 2, Athens: so-called Temple of Theseus. No. 3, Athens: Propylaia. Nos. 4 and 5, Athens: Parthenon. No. 7, Cori (Southern Italy): so-called Temple of Hercules.

cate indeed, and the four annulets and the little groove called the gorgerin, or necking, are very minute and very carefully modelled so as to make thin and delicate lines of shadow around the column at the junction of shaft and capital. So the slight rounding-out of the shaft at the very top, above the gorgerin, is arranged so as to give a

series of little rounded lobes of shade. If, now, we were to put side by side the capitals of many other buildings, as a few are compared in Fig. 12, we should find that the curve of the echinus and the shape and place of the annulets and gorgerin were different in them all. It is evident that each designer set himself to a most careful consideration of these curves and these minute differences of place and of outline. The shaft too was delicately modelled; it was always tapered, but generally in a curve and not in a straight line. This convex swell is called the entasis, and much study has been given to it by modern archæologists in order to ascertain its exact curve and the manner of determining that curve mathematically; but there is little doubt that it was made by hand and eye only. There are other peculiarities which have been discovered by very careful measurements, as in the Parthenon. In that famous building the columns are not truly vertical, but those at the angles of the eastern portico, for instance, are set a little slanting inward at top; those next to the corner ones are set more nearly vertical, the slope becoming less and less toward the middle of the portico. Perhaps this slant in the corner columns may be put at an average of two inches in the height of about thirty-one feet. The object of this is to give an appearance of perfect solidity, and therefore of repose; not only by making the base a little broader in comparison, but also by giving the upright lines an appearance of tending to come together at top. Of course the eye could never detect the inclination; but it was thought to affect the spectator, insensibly. Another similar device was this: the

seemingly horizontal lines of the stylobate and of the entablature are really curved upward in the middle. The stylobate of the east end, in its length of about 102 feet, is crowned up a little more than three inches, and the under side of the architrave above is crowned up a little more than two and a half. At the west end the curvature is slightly greater. On the two long sides it cannot be judged so well, because of the shattered condition of the stylobate.

If, then, it seems surprising and incomprehensible to the modern student that the Greeks, with their great power of invention, should have gone on for a century or more repeating so closely the features and the general disposition of their Doric buildings, it is equally surprising that they should have found satisfaction in such very minute and invisible refinements of design. Their architectural conception hardly included ornamental sculpture as an adjunct (Sec. V.), and the general scheme of the temple was not changed from two or three main types. The arrangement and re-arrangement of mouldings with delicate profiles, and the determination of a greater or less slope or curvature, were clearly important elements in their design. This, with other indications, would lead us to believe in an artistic sense among the Greeks far superior to that possessed by any modern community of European stock.

III

After the Doric temples, the most numerous Greek buildings known to us are those the principal design of which is like that of the interior orders of the temple of Bassai and the Propylaia of Athens — alluded to above. The most striking feature of this Ionic style, as it is called, is the curious capital with what are called volutes; that is, spiral ornaments (see Fig. 13); but all the other members of the Ionic order differ, as well, from those of the Doric order.

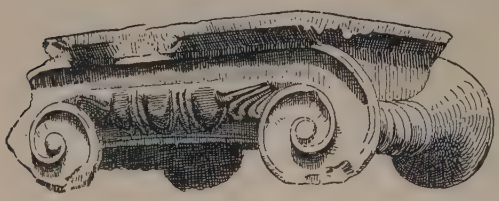


FIG. 13. Ionic capital, found on the Acropolis at Athens.

One small Ionic temple stands on the Acropolis of Athens, close to the Propylaia. This is known to be the temple of Athena the giver of victory, or Athena Nike; or, as this impersonation of the patron goddess is sometimes called, Nike Apteros, or the Wingless Victory. This little building had been entirely removed, and its fragments built into the wall of the Turkish or Venetian fortress built upon the Acropolis; as it now stands it has been put together again since the fortress was torn down about sixty years ago; it is therefore not certainly correct in general form, although valuable for its details. Near the Parthenon, on the northern edge of the Acropolis, is a wonderful double or triple temple called the Erechtheion,

from Erechtheus, to whom it is known to have been dedicated, at least in part (see Fig. 14). This building has a hexastyle Ionic portico facing the east; a tetrastyle Ionic portico to the north and on much lower ground; and a very curious and beautiful portico of Caryatides to the south, for which see p. 39. The west end of the main building, opposite and corresponding to the east portico, is lost; the wall that remains,[1] reaching halfway up the height of the north portico, is plain and smooth, except for a small door which is absolutely unornamented and which probably opened into some structure that has now wholly disappeared. The fact that the building is as irregular in plan as its site is uneven, and that its interior, although only sixty feet long, is seen to have been divided into at least two, and probably three, sepa-

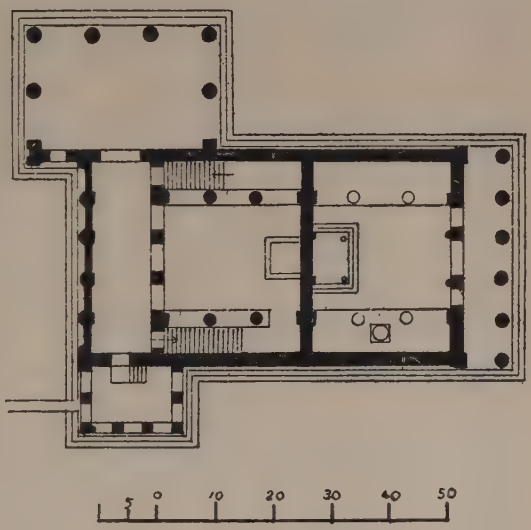


FIG. 14. Athens: Erechtheion. Finished about 407 B.C. Plan.

[1] In 1852 a storm blew down the wall which stood upon the present low wall or dado; the wall so destroyed is shown in Stuart and Revett's book as having three windows and four engaged columns. There can be no doubt that all that superstructure was of a late period, probably built in the fourth or fifth century, to make the building useful as a Christian church.

rate rooms, has caused great discussion as to the original dedication of the temple. It is generally thought that a part of it was dedicated to Athena Polias, or Athena as the guardian of the city, a part to Erechtheus, and a part, perhaps the south porch only, to Pandrosos, a daughter of Kekrops; but it may have been that one or the other of those shrines was outside of the building as we now have it.

Other Ionic temples were as regular in form as are the Doric ones; but it is noticeable that fewer of those which are known to us were peristylar, or had columns on every side. The forms known as prostyle and amphiprostyle were more common. On the other hand, the great temple at Branchidai near Miletos was dekastyle and dipteral (see Glossary), and must have had 108 columns in its outer porticoes. In like manner at Ephesos the great temple of Artemis, that of Zeus at Aizani, that of Athena at Priene, that of Dionysos at Teos, that of Aphrodite at Aphrodisias, and that of Artemis at Magnesia, all on the western coast of Asia Minor, were Ionic temples. These are all ruined so completely, perhaps because overthrown by earthquakes, that a very laborious task of digging, exploration, and comparison must be undertaken before they can be understood. The restorations of them in published books are generally untrustworthy.

There are, however, some few recently discovered or recently studied Ionic buildings which should be named apart, as showing how, in the changed conditions of the Greek world under Alexander and his successors, the Ionic order was applied to other than the old temple architecture. At Bergama on the western coast of Asia

Minor are the ruins of the ancient Pergamon, and among these are the remains of an amazing structure. High up on the rocky hillside is a square platform, and from this platform there rose a high retaining wall, broken through by the broad flight of steps which led to the square open court, in which stood the great altar of Zeus. On three sides of this court stood a building, or at least a portico, of Ionic columns, the two fronts of which, one on each side of the central court, much resembled the fronts of temples. The great retaining wall was covered with sculpture in high relief and of heroic size, representing in a very spirited fashion the battle of the gods with the giants. At about the same epoch was the portico erected by Attalos of Pergamon in the city of Athens. This was a two-storied structure having Doric columns below and Ionic columns above, and among the Ionic columns some pillars of the curious form mentioned below as belonging to the tomb of Mylasa, but Ionic instead of Corinthian in detail.

The best preserved as well as the most elaborate specimen of the Ionic order, though a small building, is the Erechtheion at Athens. This is also the most beautiful in form and in sculptural ornament; and here, more even than elsewhere, is seen evidence of that minute care for small details which is the most marked characteristic of Grecian architecture. Figure 15 gives the order of the Erechtheion restored from fragments of that building. It will be seen that the capital has two sides and two ends, and is not the same on all four sides, as is the Doric capital. The Greek builders did not like the effect of these two-sided capitals at the angle of a peripteral build-

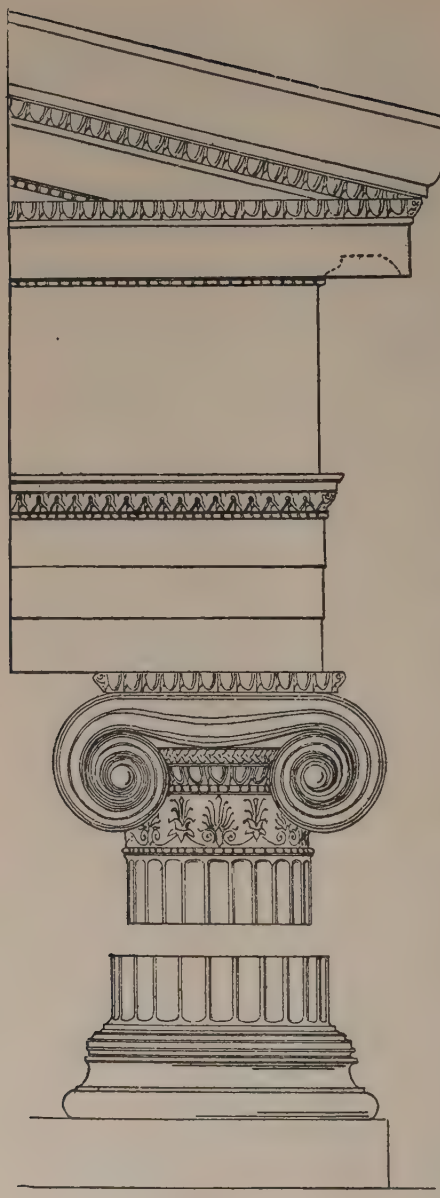


FIG. 15.

ing, where capitals showing their broad sides and volutes must stand next to the corner capital which shows its ends; and accordingly a capital was invented of which the plan may be seen in Fig. 16. Figure 17 shows such a corner cap seen from within. Still another plan was tried: that having four volutes set off at the angles, radiating from the centre of the circle formed by the plan of the shaft. Some archæologists think that this was the earliest form of Ionic capital.

In other details the Ionic order is more free than the Doric. Bases of two different patterns are used for the columns, and there are varieties of each of these. The entablature differs greatly in different examples; in general the frieze is uniform, without tri-

glyphs; the architrave is stepped into two or three different surfaces, slightly in projection, the upper ones beyond the lower; and there are carved ornaments similar to those of the capital. The shaft of the column is grooved with what are called flutes, usually of circular curvature, and separated by fillets. As there are so very few monuments of the Ionic style which have been thoroughly studied, it is best to take the beautiful and well-known Erechtheion as its type. Figure 18 gives an angle of its hexastyle portico, without its more elaborate sculpture. This should be compared with the Doric type, Fig. 10.

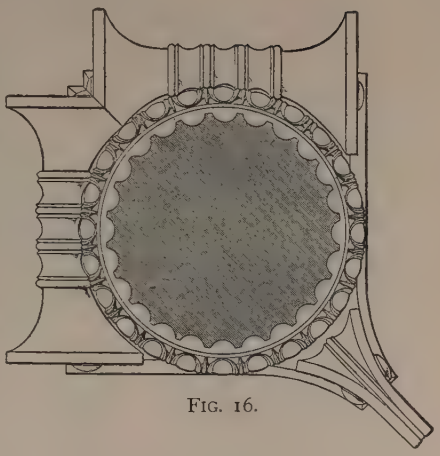


FIG. 16.

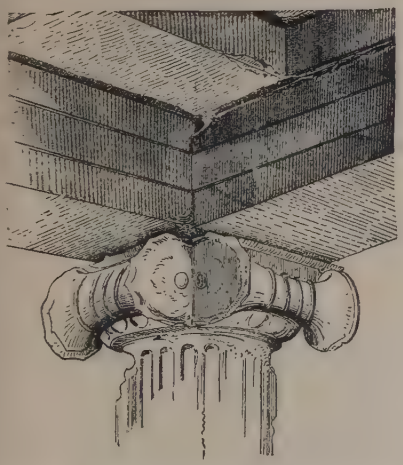


FIG. 17. Athens: Temple of Athena Nike; one of the corner capitals seen from within. Close of fifth century B.C.

The Ionic style prevailed especially in the Greek colonies of Asia Minor. Its richest and largest buildings, so far as we know, are later than those of the Doric style. If the epoch of greatest splendour of the Doric is set at 430 B.C., a few years after the Parthenon, the

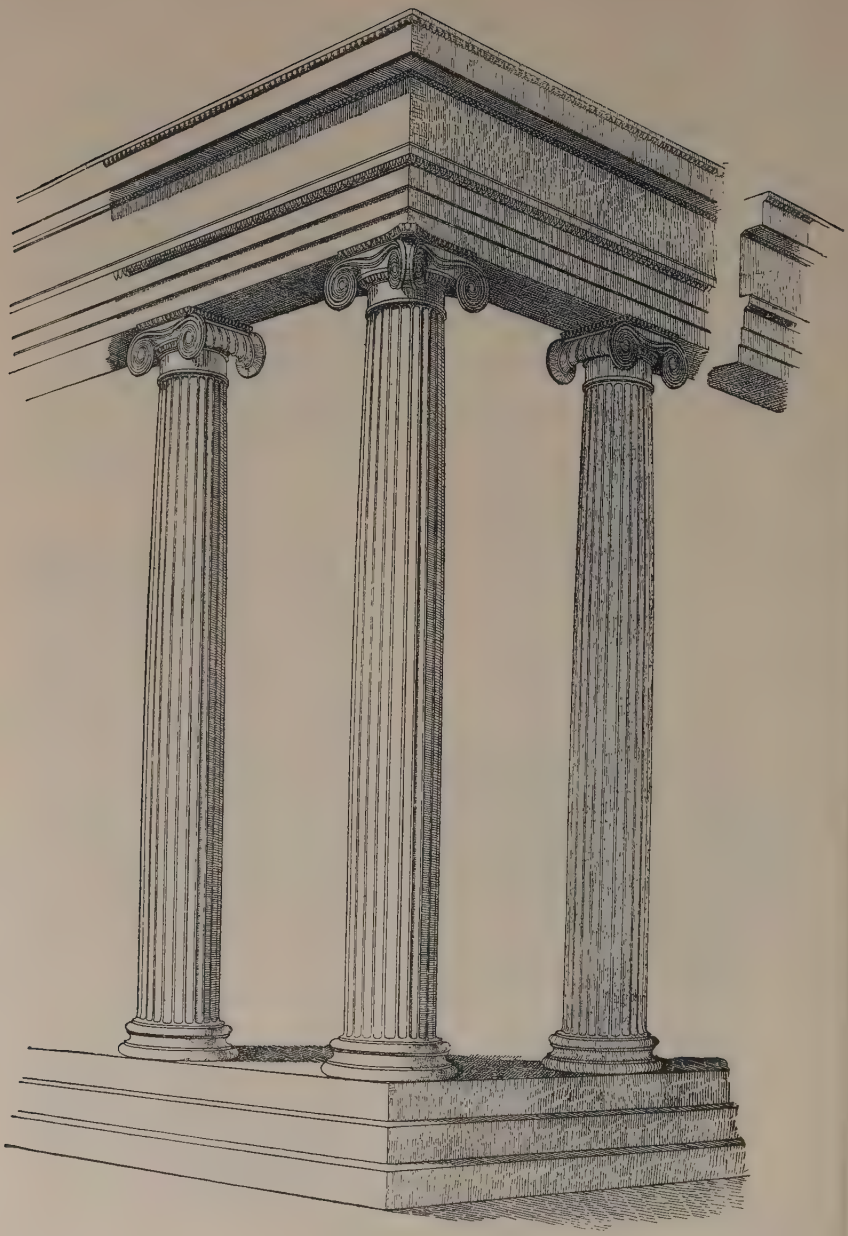


FIG. 18.

Propylaia, and the temple of Zeus at Olympia had been completed, so far as we know, then the time of greatest splendour of the Ionic style was perhaps a century later. It seems evident that the artists of the years after 430 felt more and more drawn to a style more elaborate in a purely architectural way than the Doric; and that they found this in the Ionic style with its greater freedom, and also with its greater abundance of purely architectural sculpture. Figure 18 shows something of this sculpture. The capital has its volutes, and a ring of what we call the egg-and-dart ornament, and below these a broad band, sometimes adorned with the honeysuckle ornament, which is a row of anthemions or bouquets of two different patterns in alternation; similar bands of ornament are on the edge of the cornice, and at different parts of the entablature. There are indeed but three or four different patterns in use in the whole Grecian Ionic style as we know it by its remains, and it is as surprising to us to note this contentment of the artists with their few patterns as to note that willingness of theirs to cling to the Doric style and to the Ionic style so long. But at least the Ionic style has this architectural carved ornament, while the Doric style has none.

IV

There are, among the Greek buildings which have been studied, some curious pieces of mixed style and uncertain date, as in the so-called Absalom tomb near Jerusalem and the tomb of Theron at Akragas, where a triglyph frieze is

combined with an Ionic order; and there are a few exceptions to all rules, as at Assos, where the temple architrave is sculptured. The marvel is, however, that these exceptions of all kinds are so few in the aggregate, and so unimportant in most instances. The time came, however, when the Ionic style was to be modified into something very new indeed, — another style, which the Greeks had begun to use when the time came for their pure and refined art to pass into the bolder and coarser Roman development. This style is seen in the little circular building in Athens known as the Choragic Monument of Lysikrates (Fig. 19). The capitals here were surrounded by a belt of leafage of great richness, and above this was a combination of scrolls ending in volutes, leaves like those below, and anthemions. These capitals are so shattered that no photograph nor exact drawing of one of them would explain their design, and the reader is referred to Fig. 21 for a Greek Corinthian capital of still finer type. Figure 20 gives one of Stuart's excellent prints of details of the roof of this little building. The only other building on the mainland of Greece which is known to have had Corinthian capitals was the Tholos or round building at Epidauros. This had a ring of fourteen Corinthian columns within the circular wall of the sekos and a ring of twenty-six Doric columns outside of and surrounding the same circular wall. Figure 21 gives a capital of this order. It is more massive and more evenly filled with foliage than the capital of the Lysikrates monument can have been. A capital has been found in the ruins of the temple at Bassai near the ancient Phigalia, on the western coast of the Morea; one also has been found

FIG. 19. Athens: Choragic Monument of Lysikrates. Built about 334 B.C.

among the ruins of the temple of Apollo at Branchidai, on the coast of Asia Minor. The little octagon building of

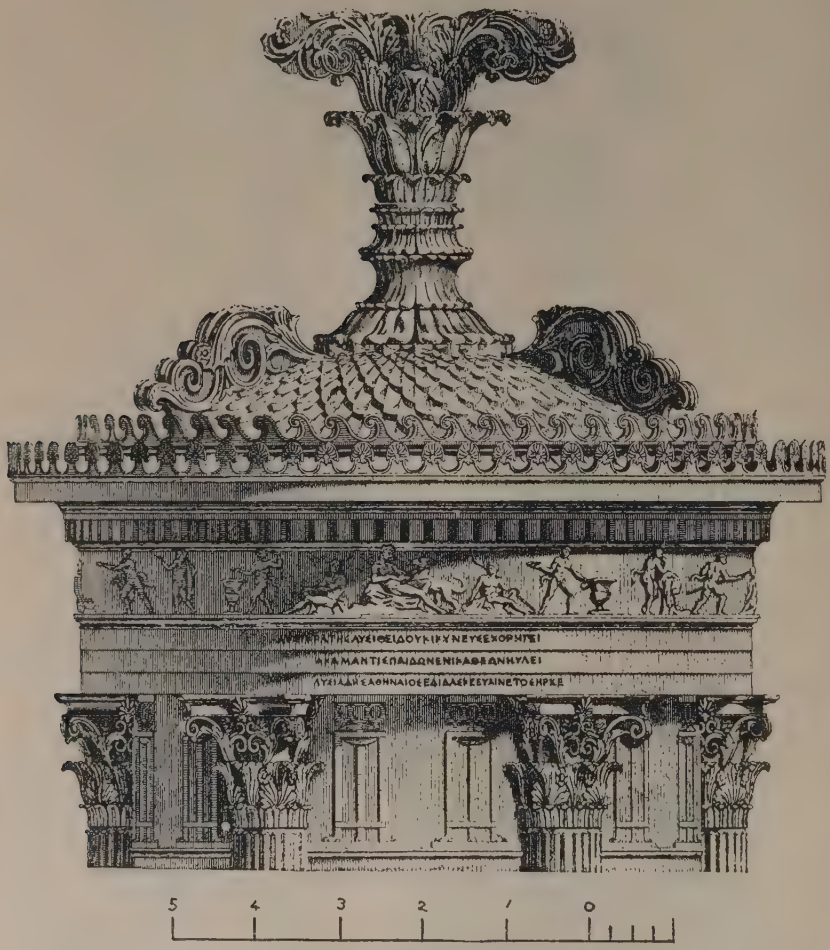


FIG. 20. Athens: detail (see Fig. 19).

later date, also in Athens, and called the Temple of the Winds, from the sculpture upon it, though really built to

contain a clypsedra, or water-clock, has at its doorway two pilasters with capitals now much injured; others have been

FIG. 21. Epidauros: capital apparently intended for the Tholos, about 300 B.C.

found in the Grecian islands; and the general character of these is shown in Figs. 22, 23. These various types of capital are different enough; and yet by common agree-

ment they are classed together as of the Corinthian style; chiefly because it was afterward the Roman practice to use each of these patterns of capital, as well as many more, with the other details of the Corinthian order. The Lysikrates monument is known to have been erected soon after 335 B.C.; that is, during the early years of the reign of Alexander the Great, and long after the great age of the Doric temples, and even later than the great epoch of the Ionic style. The Tholos at Epidauros may be supposed to have about the same date. And yet, late as it is, this is the earliest date at which we can be sure that Corinthian decoration was used. In the island of Samothrace are the ruins of a cylindrical building which have been thoroughly examined and their meaning shrewdly explained by German archæologists. There was a ring of pillars carrying the roof (see Fig. 24), and each of these pillars was finished on the outside nearly like a Doric pilaster. On the inside, however, each pillar had a half-round, engaged

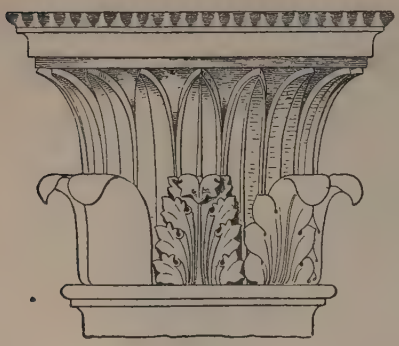


FIG. 22.

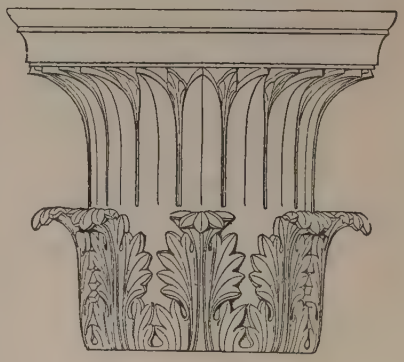


FIG. 23.

FIG. 24. Island of Samothraki (Samothrace): Restoration of a building of fourth century B.C.

column, with Corinthian details complete. At Melassa, on the western coast of Asia Minor (the ancient Mylasa), is a curious tomb, which has four corner piers, square, with

Corinthian details, and eight smaller pillars made up of two half-columns each, all Corinthian. The conclusion is that the Corinthian style had been used in but few buildings when the wars which preceded the Roman conquest came and were followed in Greece by exhaustion and comparative languor under the Roman rule. The Roman imperial governors and their architects took up this style as their favourite one, and did wonders in its use, as will be related; but the Greek Corinthian of the mainland of Greece, so far as known to us, is in the few buildings named above, and there it appears that it had not been completely matured: it is still a modification of the Ionic style.[1] Something of that character it retains in the buildings of the islands and of Asia: it seems to have been still undeveloped when the East was brought under Roman influence.

V

Many of the Greek temples known to us were decorated by figure sculpture, and some of this is of such unsurpassed excellence that it has given great fame to the buildings which once held it: thus the temple at Ægina (p. 7) would be a ruined Doric temple less important than many others, but for its famous statues representing the battles before Troy, now in the sculpture gallery at Munich. Greek figure sculpture had its own development, quite apart from that of Greek architecture. Separate statues were set up on tombs, on pedestals in

[1] The Epidauros Corinthian was more developed, but there are curious circumstances which seem to show that it was still an unfamiliar style.

the temples or in the sacred enclosures, and along the public ways; and marble slabs richly carved in relief with groups, symbolical or commemorative, were used as tombstones, or as records of treaties made, victories won, or decrees published; or, finally, as votive offerings. Relief sculpture is obviously that which most easily finds its proper place on the walls and pillars of buildings; and, accordingly, the outside of the naos walls as in the Parthenon, the inside of it as at Bassai, both the inside and outside of the bounding wall of a sacred enclosure as at Gjolbaschi in Asia Minor, the outer face of a great retaining wall as at the Pergamon altar, the outside of a parapet as around the temple of Nike Apteros at Athens, the outer wall of a tomb as in the Xanthos tombs, the sculptures of which are now in the British Museum, a well-curb as in the one from Corinth, now lost,[1] the shafts of columns and the plinths which support them as at Ephesos and Branchidai, and the epistyle in one case at least at Assos, are charged with such sculpture. The metope slabs were sometimes sculptured as at Bassai, Selinus, Assos, the Theseion and the Parthenon at Athens, and this sculpture was sometimes in very high relief, the figures almost separated from the background. It is noticeable that sculpture is seldom put on the constructional parts of the building. It is generally put in the metopes, which are mere filling-in slabs, however thick they may be, or at the top of a wall which does not seem to do much work except as an enclosure, or upon

[1] See Stackelburg, *Gräber der Hellenen*; Michaelis, *Ancient Marbles in Great Britain*.

accessories. The capitals are not sculptured at all in the Doric style, and but little in the Ionic style, and of sculptured shafts, bases, epistyles, and other such working members of a building, only a few instances occur. We shall find a very different state of things in other architectural epochs. The Greeks seem to have hesitated to carve their buildings. In the Doric style, which seems to have been much more common throughout the whole Greek world than the Ionic, they used no ornamental sculpture at all, and figure sculpture only in metopes, and most rarely in a continuous frieze. In the Ionic style they used a good deal of ornamental sculpture, but only in small and very narrow bands and lines, and only of five or six patterns, constantly repeated with slight changes; and they used figure sculpture tentatively, as it were, trying it in this part of the building and in that. There are almost no instances of that mingling of ornamental and figure sculpture, that insensible passing of one into the other, which was not unknown in Roman work, and which is the very life of later styles.[1] The draped maidens used as pillars in the south porch of the Erechtheion (Fig. 25) are the best instance known to us of true Greek architectural sculpture of a high order. To such figures the name Caryatide was applied at a later time. These carry an entablature, exactly as if they were columns. Indeed, the whole ordonnance of figure, stylobate, and entablature

[1] The Eleusis capital with winged goat-headed griffon; the Erechtheion anthemion with a bird; the Priene pilaster head with a pair of griffons; the marble chair in the theatre at Athens, described on p. 40 — are exceptions and show us how little is really known. The reader is reminded, too, how few Ionic buildings have been thoroughly studied. See Section III.

is considered an order, although the entablature may be more simple than that of a large portico, as is the case in the Erechtheion Caryatide porch; and this is called a Caryatide order, or sometimes a "Persian" order, for no

FIG. 25. Athens: Erechtheion, the southern portico.

good reason. That really is architectural sculpture of the most admirable sort, and it is greatly to be regretted that we have not more such instances of Greek imaginative creation and good taste and judgment in such matters. One other but less fortunate instance will be named below in connection with the temple of Zeus at Akragas.

There can be no doubt that there existed decorative sculpture of the best time, applied to buildings as well as to those minor objects which are preserved in our museums.

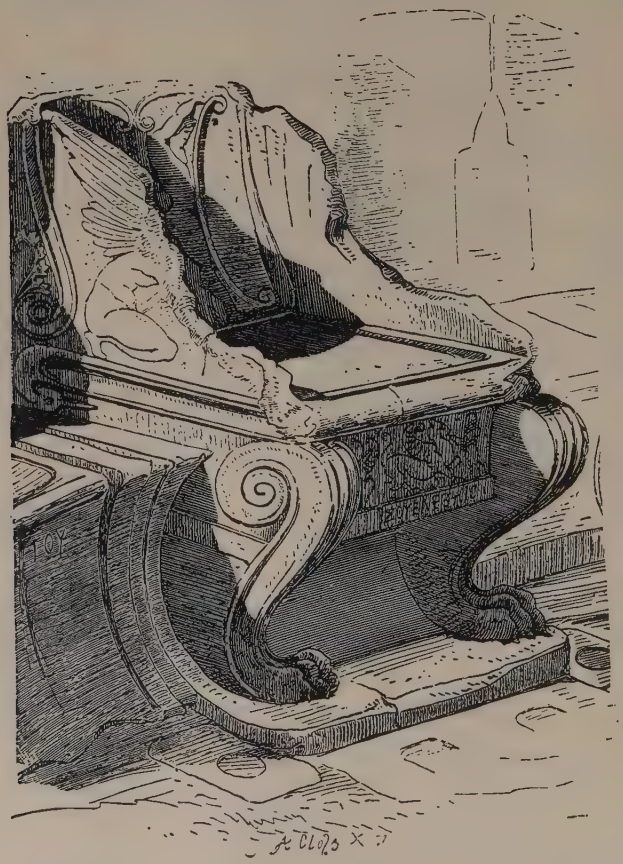


FIG. 26. Athens: marble seat in Theatre of Dionysos.

An admirable example of such sculpture, given in Fig. 26, applied to a fixed marble throne in the front row of seats of dignitaries in the theatre of Athens, goes far to prove

the existence of similar work applied to temples and porticoes.

In three or four cases known to us the pediments of a building were filled with sculpture. This sculpture was *in the round*, that is, the figures are full statues, standing free; the tympanum behind them serving merely as a wall against which they were seen. The most admirable of these instances is also fortunately the best known, — the collection of statues from the Parthenon now in the British Museum. These are, in the opinion of many, the most perfect works of sculpture known, unequalled in beauty and in power. The archaic Ægina statues in the Munich Glyptothek, though elaborately restored by Thorwaldsen, are still of great value in the history of sculpture. The recently discovered statues from the temple of Zeus at Olympia were a disappointment to lovers of Greek art, who had hoped to find in those pediments described by Pausanias something more comparable to the figures of the Parthenon. Their singular lack of finish and their exaggerated force and almost violence of expression are, however, of high interest. The questions which arise with regard to them cannot fail to widen immensely for us the field of Greek sculpture and its decoration by means of colour. Lastly, in the small treasury building of the Megarians, at Olympia, we have a few remains of pediment statuary.[1] In these examples it is very noticeable that, while the pediment is selected as being a good place to exhibit statuary, and while the deep recessing of the tympanum may well have been planned with a view to such

[1] It is as yet (May, 1896) impossible to judge of the discoveries at Delphi.

placing of statuary, these splendid sculptures are still in no sense architectural. Where such sculptures exist, the whole building, or at least its front, becomes a pedestal and a setting for them. Even the front of the Parthenon in the time of its splendour was not too rich or too beautiful to serve as a mere adjunct to the unparalleled groups of statuary in its gable. Moreover, the free use of colour aided in uniting these groups with the architectural composition and in producing a harmony which it is very hard for moderns to understand. The most noticeable and important consideration is, however, this, that the statuary was conceived by itself, and made up into groups by itself, with no reference to the building more than was necessary for placing it. Why this is not architectural sculpture we shall understand better when we can compare other styles of architecture with this of the Greeks.

VI

There are a few monuments left us by the Greeks which are especially hard to understand. Such is the great temple of Zeus at Akragas. When it was thought to be of a late epoch, perhaps Roman, its strange character was more comprehensible; but it is now recognized as a building described by ancient writers and belonging to the best period of Doric art. It was complete except for its decoration before 409 B.C., and was almost contemporaneous with the Parthenon. The ruins have not been thoroughly studied, but it seems clear that it was a wholly enclosed structure (see the plan, Fig. 27), built in the

semblance of a peripteral temple. It was very large, about 350 feet long and nearly half as wide, and all that space was enclosed with solid walls, the outside face of which was built with huge semicircular projecting piers, designed so as to resemble half-columns of the Doric order. These were not real columns between which screen walls were built, but were constructed together with the walls,

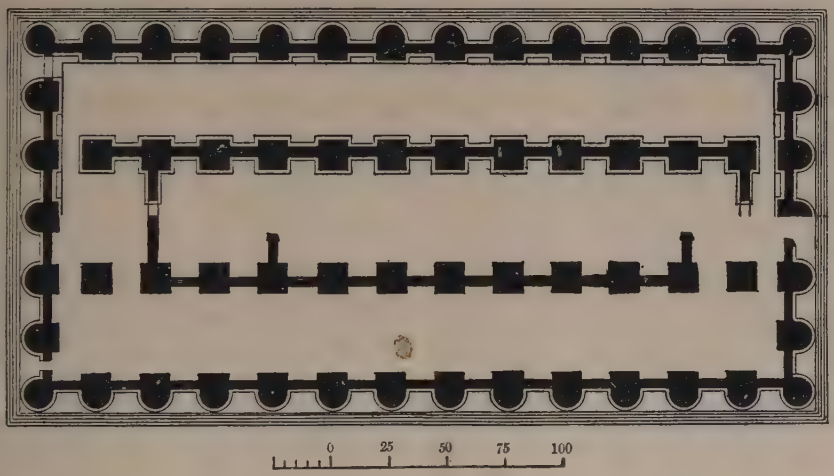


FIG. 27. Girgenti, Sicily: ruins of Akragas. Temple of Zeus. Approximate plan.

and of comparatively small stones, all bonded together. The plan of the interior is not perfectly understood, but the interior decoration seems to have included a number of gigantic male figures used as pillars to carry an entablature of some sort. Such male figures are called Telamones, and sometimes Atlantes. There are very few instances of their use in ancient art. It is greatly to be desired that these ruins should be thoroughly explored, the fragments measured and compared, and brought together

in the juxtaposition that their form and markings dictate, and the original plan and arrangement of the building rediscovered; for here is a gigantic edifice of the best time of art, although in an outlying colony, which seems to contradict or ignore the principles of design which we deduce from all the other Greek buildings known to us.

It is in reference to the temple of Zeus at Akragas that the excellent suggestion has been made that the Greeks may not always have made the outer coatings of stucco of uniform thickness throughout. It is well known that the temples built not of fine and close-grained marble as in Athens, but of softer stone not capable of taking a fine surface and of retaining a sharp edge, were covered with plaster, cement, or stucco of some kind, concealing the joints, and bringing the whole structure to the semblance of a monolith, or to that of a solid block of fine concrete or artificial stone. Scraps of this surface-coating are often found clinging to the stone and sometimes still holding the colour which had been applied to them. Now, where the stone-work left to us is very rough and coarse, it is a natural assumption that in that particular case the architect had expected to model in this outer coat of plastic material all his delicate ornaments and even to bring out the exact curve desired in the echinus of his capitals, if not that also of the entasis of his shafts. The smaller details, such as the annulets of a Doric capital, would naturally be left entirely to the worker in stucco. And the importance of these considerations is seen in the fact that archæologists have too freely taken the shape of the cut stone, as found at Pæstum, Segesta, or Akragas, as

the final architectural form to be studied, and have found its inferiority hard to understand.

VII

Painting in vivid colours was applied to Greek buildings generally. We are not able to decide whether some kinds of buildings were more freely painted than others, nor whether a temple was usually covered all over with painting, down to the very stylobate. But it seems clear that all the most important parts, such as the capitals, the mouldings which divide the entablature, etc., were painted with patterns in three or four bright colours, — red, blue, and yellow or buff, sometimes green, and often gilding; that the sculpture was covered with painting, which often was relied upon altogether for some of the details of costume and other accessories; and finally that large surfaces of plain walling, of the shafts, etc., were painted in plain colour, probably relieved with borders and bands of patterns. In fact, a Greek temple, whose yellow-white simplicity and majesty has been so much admired by the moderns, must be thought of by students of ancient art as glowing with colour, the four or five positive colours employed being modified by light and shade and shadow, and still more by full sunshine, into hundreds of delicate tints.

VIII

Greek dwelling-houses were very simple and generally very small, throughout the times of the purest art, and even in later times their exterior was not architecturally

important. But few and slight remains exist; but it is evident that with the Greeks, as generally in antiquity, and still commonly in the lands of the Mediterranean, the outer walls were blank and hardly even pierced with windows, and that all beauty of design and all decoration and architectural elaboration were kept for the courts and chambers within.

So far as our knowledge extends, Greek building of the pre-Roman epoch knew neither windows nor chimneys. The placing of story above story is known to us only in the cases of the interior colonnades of temples, as at Pæstum, and of porticoes such as that of Attalos in Athens. For these reasons the common assumption that Greek houses were very like Roman houses and may be judged by what we know of the latter is not safe. The Romans used second stories freely, and even third and fourth stories, and windows, as was to be expected.

IX

Greek theatres were generally arranged upon hillsides, the funnel-shaped hollow being partly natural, partly dug out, partly built up. The bottom of the funnel was occupied by the orchestra, in which the chorus danced, sang, and recited, and the stage and whatever rooms were built behind it for actors occupied one side of this, so that the funnel was completed for only little more than the half-circle. No remains of the stage and its accessories exist of any building of the great time: those which we possess, even in ruins, are of the time of the Roman Empire, when it

was natural to rebuild all theatres in accordance with the changed conditions of theatrical performances.[1] These buildings were of course open to the sky. Only the stage and its appliances had even a partial roof, and this would not rise high nor occupy much horizontal space. The roofed music halls, as we have their remains, the largest being in Athens, are of Roman time. The Stadion, or running-ground, and the Hippodrome, or enclosure for horse exercises, were low and open, not rivalling the great Roman structures used for similar purposes. Indeed, the only structures in or about a Greek city which would vie with the temples in importance and in height and architectural display were some few of the tombs which were erected in a suburb. The so-called tomb of Theron still remains among the ruins of Akragas: a two-storied structure without doors or windows, of undetermined date. Many such structures exist in Asia Minor, in the neighbourhood of the ancient cities of Mylasa, Xanthus, Limyra, Knidos, and Halicarnassos. Some of these are roofed like temples; some with pyramidal piles of steps; some have only columns to support the roof, while others have small enclosed rooms, like those of temples, within the peristyle. Some, again, are without columns, and are solid-walled, closed structures, having but small window or door openings, if any. They all affect considerable height in proportion to their horizontal size, and this height is got in general by a plain basement of heavy stone-work, upon

[1] So great was this change, that it has been urged upon excellent authority and with great appearance of truth that the Greeks used no elevated stage, but that all performers stood on the level of the orchestra.

which the more decorative upper story is raised. Some of these have a great deal of sculpture, especially friezes, as in the case of the remarkable tombs whose remains, brought from Xanthus, are in the British Museum; the so-called Harpy Tomb and Nereid Tomb. Statues were also set between the columns of the peristyle or upon the corners on the summit of the roof.

The chief of all these structures, one famous throughout the ancient world, is the tomb of King Mausolos at Halicarnassos, erected after his death in 351 B.C. The remains of this have been discovered, and many of the sculptures removed to London, but there is still dispute as to its exact design. There seems no doubt, however, that it had the high basement, the peripteral temple form above, and the pyramidal roof. Pliny in his "Natural History" describes this building rather fully, and from his account it would have been 140 feet high and have had thirty-six columns in the peristyle. The order used was Ionic, it was all built of fine white marble, and there were several hundred running feet of elaborate carved friezes, the exact placing of which is undetermined.

X

Picturesque sites, such as steep and rocky hills, were common in Greece, and it often happened that these were chosen as the sites for temples because of their character as the central and strongest part of some city. But apart from this, a real preference seems to have existed for broken and irregular disposition of the buildings forming a group, as of the temples, treasuries, and monuments in a

sacred enclosure. Thus upon the Acropolis at Athens the Propylaia, the Erechtheion, and the Parthenon, and the buildings which have been destroyed, as far as we know them, were all built at irregular angles with each other. In like manner, in the sacred enclosure at Olympia, although the row of treasure buildings under the hillside is a crowded row, the small oblong structures standing side by side on a platform and all facing southerly, yet these are set on at least five different angles. Moreover, the larger temples within the enclosure have not their sides parallel to one another, nor are any two of them set upon the same axis nor with their fronts on the same line. At Epidauros the oblong temple is not set square with the walls of the enclosure nor with those of the great stoa which closely adjoins it; and, moreover, the Tholos is not on the axis of any of the buildings whose traces remain. At Samothrace the same irregularity of position prevails, and four rectangular buildings and one round one are found to have stood with what is in plan alone complete irregularity. This is strangely contrasted with the extreme formality and uniformity seen in most of the public buildings themselves, as we know them. This regular oblong form comes, however, naturally and unavoidably, of the extreme simplicity of the plan. If nothing is wanted more than two small rooms with a recessed entrance to each and a portico around the whole, a parallelogram is the natural shape for it to take, and a single broad roof in two equal pitches comes equally of the requirements of the structure. As soon as this simplicity of requirement disappears, and it becomes for any reason more natural to set

the different buildings of a group or the different parts of one building on different levels or at varying angles with a common straight line, these irregularities are used freely and as a matter of course. Picturesqueness was as dear to the Greeks as regularity; what they wanted was effect, no matter how obtained. Still, however, there could have been no towers, no buildings really lofty in the sense of later architectural styles, no gables, no belfries and cupolas, in any Greek city. And a reverence for the horizontal line, and for quiet succession of similar parts, was evidently in the very heart of their architectural conceptions.

CHAPTER II

ROMAN IMPERIAL ARCHITECTURE. It prevails throughout the Empire, but Local Feeling and Materials cause Modifications of it. Duration approximately from 50 B.C. to 350 A.D.

I

The term Roman Art or Roman Architecture must not be understood as descriptive of the art of a city or a people. The building and the fine art of the Roman people, while theirs was still a small state, having its own unmodified and unbroken traditions, have perished. We can only suppose that they were very much like the building and the art which we know as Etruscan (see the introduction), as indeed are the few fragments that remain. These are of massive construction in cut stone; but wooden construction and terra-cotta roofing and painted terra-cotta sculpture were also certainly characteristic of Etruscan architecture, and must have prevailed, even in the city of Rome, down to the Sullan dictatorship at least. Two or three buildings only in the city of Rome retain any trace of even the later Republic, as it was after the conquest of Carthage and Macedonia, and the acquisition of supremacy in the lands of the Mediterranean Sea. Nor is it easy to identify any buildings in Italy of

this epoch as having been designed or modified to meet Roman requirements. The Greeks of South Italy and the Etruscans went on building in their own fashion, down to the times of Augustus, as is instanced by the temple at Cori (see Fig. 35).

What we call Roman buildings are, with the possible exception of two or three which may date from the second century B.C., those of the imperial epoch, built anywhere within the bounds of the Empire. These might be erected at the cost of local officers of state, or provincial Roman governors, or at the cost of the imperial treasury, or by towns or districts; but they were, with exceptions to be noted, of the same general character. Thus a basilica, a temple, or a theatre, built by a legatus in search of popularity in a small city of Gaul or of the East, would be as like to one of the great basilicas of the capital as, in modern France, a small village church or town-hall is like a large city church or the Paris *Hôtel de Ville*. The structure would be conceived in the same general way, and carried out with similar materials and with the same general relation of exterior to interior. The same general principles of design, also, would apply to the larger and to the smaller structure. This is true also of the Thermæ, or great bathing establishments, of the imperial palaces and villas of private persons, of the aqueducts, bridges, theatres, amphitheatres, tombs, triumphal arches, temples, and other monumental structures, from the Euphrates to the Atlantic. The still surviving spirit of Greek, Egyptian, or Oriental design in some parts of the Empire is, however, to be noted; though hardly to be treated ade-

quately here. This is one of the most difficult subjects in the history of architecture.

The Roman administrators had received from their Etruscan and other Italian models a disposition to use the arch and the vaulted roof. It is true that they used only the semicircular arch, alike for wall openings and for vaulted chambers, but this they used with freedom. They had also learned somewhere the lesson of strong mortar used in great quantities and of masonry of rough stone built with it. They had also learned how to make excellent bricks, and in what ways to use them. They had learned what concrete was, good ways of making it, and what it was capable of. Did their lessons in these processes of building come from the East, from Babylonia and Mesopotamia, from the then still existing palaces of Nineveh? Had the Greek architects of Alexandria and other new cities of the Macedonian Empire created an earlier Byzantine or Græco-Oriental system which the Romans followed? Whence came the knowledge and skill shown in the Pantheon in the city of Rome, built in its present form in the early years of the supremacy of Hadrian? Those questions are not to be answered in a satisfactory way. The Pantheon, however, stands uninjured in its essential features, an example of a perfected system of building and ornament. It is a cylindrical tower, without other addition than a portico of entrance; the cylinder being 143 feet in diameter within, with a wall twenty feet thick. This wall has, however, large and deep niches hollowed in it, but closed at top so that the wall (unless there are concealed chambers) is solid at the springing line of the vault.

Here, however, a new row of open chambers begins, and lightens the construction very greatly. The vault is a hemispherical cupola, having at top an open circular eye nearly thirty feet in diameter. The interior forms a single large room, lighted from the eye above and somewhat from the door, and in no other way. The height within is almost exactly equal to the width; and the cylinder occupies just half of this height, — the dome the other half. The exterior shows a huge cylinder about one hundred feet high with a low dome-shaped roof rising above it; for the exterior of the wall is carried up outside far beyond the springing line of the vault. Now the whole of this structure is undoubtedly a solid mass of masonry, everywhere composed of small stones laid in great masses of mortar, as can be seen in scores of ruined structures in Rome. The cupola is as absolutely one piece as a crockery bowl; and also it forms one piece with the ring-wall which supports it. Everywhere in the walls this masonry is faced with brick, and in the vault it is striped with bands of brick-work, indicating a preliminary construction of interdependent arches, acting as a centring or mould upon which the stone and mortar masonry was laid. As the masonry of the walls was carried up, the brick facing was built with it, forming a case to protect it while soft, and a smooth facing when it grew hard. The process of building the cupola has been a subject of controversy and cannot be determined positively, but there seems no doubt that the brick skeleton known to exist within its mass had an important function in it. The round opening in the top of the cupola is held by a huge bronze ring which serves

to protect the masonry. This ring, probably connected with a device for closing or partly closing the great oculus, is not absolutely needed in any other way, for no structure is as safe as a cupola. This one of the Pantheon does not show a crack; and although most large cupolas have been less fortunate, this is because of earthquakes, or because the attempt to get a very light roof had been carried too far. The Pantheon has always been a temple, dedicated to several or to all of the greater gods of the Latin heaven, perhaps to the gods of the Gens Julia, — that family from which the first imperial stock took its rise, — and it differs from all the other ancient temples, which are known to us in the fact of having a vast interior, where many worshippers could meet.[1] The one purpose of its designer was, then, to provide a great and stately room, and this he succeeded in; for even now, in its dismantled condition, it is one of the most impressive interiors in the world. The dome looks immensely large; the height of the whole room seems as great as it is, and yet the space horizontally is most imposing; the diffused light is admirable, and the effect of blue sky and passing clouds as seen from below through the great open eye of the cupola is surprisingly beautiful. When there is rain and a cylinder of falling drops fills the middle of the great room, a new charm is given to it. If, now, this noble interior had been decorated merely by colour, as in mosaic or painting; or by means of sculpture, whether

[1] Some buildings, however, combined a certain sacred character, as of a temple, with utility as places of meeting and the like, as the Telesterion at Eleusis, and some Roman basilicas.

in the form of reliefs in panels or horizontal bands, or in the carving of large surfaces; or in the form of full statuary, groups and single figures "in the round," the most being made of the niches, and other constructional diversities of surface, as by moulding their angles, panelling, and the like; or by lining with marble of rich colours and veining, as, indeed, was very common among the Romans: — this would have been obvious and natural. It is in some such way that a Greek would have proceeded; it is in this way that Egyptians and Assyrians adorned their great structures. But the Roman architect of the time of Hadrian had a love for the architectural forms which the Greeks had taught him, and which he had seen in the Grecian temples of Southern Italy. He did not like an interior without columns and entablatures, and so, though there was nothing to call for them, he put up, in great niches, columns forty feet high, and to explain their presence he built all around the rotunda an entablature complete in its three members and of full proportionate size. It is probable that the present interior fitting as shown in Fig. 28 is nearly as in antiquity. This entablature[1] is put at the right place for effective division of the walls. There is also a smaller group of mouldings at the spring of the vault. The great niches are not without good reason in the way of decoration. The columns, too, divide them in a very pleasing way. But that the lower band, the great entablature, should pretend to be part of a post-and-lintel structure, while essentially an ornamental

[1] For the use of the entablature and its origin and significance see "Greek Architecture," Chapter I.

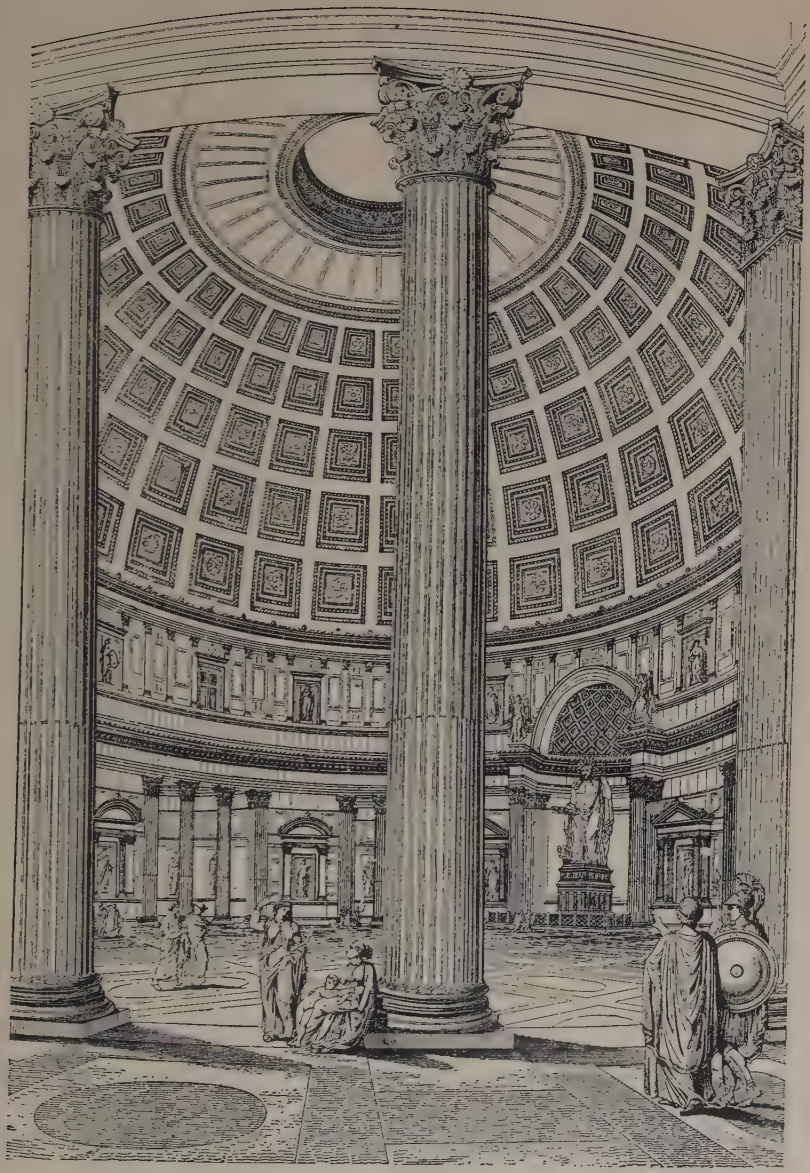


FIG. 28. Rome: Pantheon. Built about 120–124 A.D. Isabelle's restoration.

appendix to a vaulted structure, was a novelty in architectural practice. It was hardly less a novelty, that this entablature should cross the great niches, with marble columns to hold it up, and all for no purpose but the further decoration of the great vaulted room.

The portico of the Pantheon, whether a century earlier in date than the rotunda or not, is really Greek in structure; that is to say, it consists of columns carrying an entablature, and a gable-roof and pediment upon that. The form of this portico is not of Grecian beauty, nor is its connection with the huge round tower at all well managed, but it is fine in detail, with magnificent monolithic shafts of granite and Corinthian capitals, and it once had a great composition of statuary, filling the tympanum of its pediment. The exterior of the rotunda itself was faced with slabs of marble for about one-third of its height, and with stucco above. The cupola and the stepped slope below it — in short, all parts of the roof — were covered with bronze plates heavily gilded, and around the eye of the cupola there may have been a prominent cresting of some kind, as the bronze ring still there suggests.

There is no other building like the Pantheon; but large cupolas roofing round halls are not rare in the Roman world. The great Thermæ seem to have had such halls for their caldaria, or hot rooms; indeed, the Pantheon has been thought to be the caldarium of the Baths of Agrippa, but that is disproved. The caldarium of the Baths of Caracalla still exists as a giant rotunda. That which is now called the temple of Minerva Medica was such another, but ten-sided, with a large niche in each of the sides, and

crowned with a circular dome about eighty-three feet in diameter. All these, and many smaller hemispherical vaults, were built in the same fashion, uniform solid masses of masonry made up of broken stone and other material held in a mass of strong mortar.

Besides the cupola, the barrel- or cradle-vault and the groined vault were used freely by the Romans: the latter, sometimes, on a gigantic scale. A barrel-vault, as built by the Romans, is merely a half-cylinder; the roof of an ordinary, round-arched railway tunnel is such a vault. A groined vault is made of two barrel-vaults crossing each other, their rounded surfaces intersecting in sharp edges called groins. These groins (see Fig. 29) start off at the abutment or spring of the vault as right-angled projecting corners; but they begin at once to grow more obtuse, soon they nearly disappear, and there is no trace of them at all at the crown of the vault. To build such a vault there is needed a large and complete centring or centre, a roof-like structure, generally of wood, having exactly the shape in convex form of the concave vault desired. That is to say, the centre is a model upon which the vault is built or cast, after which the centre is to be taken away. This being put into place, within the walls already carried up to the spring of the future vault, the Roman constructor went to work with bricks set in his strong mortar, and built either a thin continuous shell or a network of narrow bands of arched work with cross stays between the arches. Then upon this brick-work, and encrusting it in the mass, he built up his solid vault, six or eight feet thick where the span is large, and filled in almost solid at the haunches, all

of small stones set in a bath of half-liquid mortar. It is no longer arched construction at all, although it seems to be so, and although it is undoubtedly a development of arched construction: it is monolithic; it is made nearly as we make foundations of concrete or in some parts of the country whole buildings, by means of a monolithic process, not of separate stones and bricks, but by constantly adding more of the solid homogeneous mass.

Groined vaults built in this way cover in the great Tepidarium of the Baths of Caracalla, eighty-two feet span, of the Baths of Diocletian nearly as large, of the Basilica of Maxentius and Constantine, eighty-six feet span, and many smaller rooms. The Basilica of Maxentius and Constantine, formerly called the Temple of Peace, is still to be studied on the northeast side of the Roman Forum. Only one-third of it is erect, but a notion of its structure and a sense of its unequalled magnificence of size and mass can be got from the three great bays which are still roofed. The main hall, corresponding exactly to the nave of a three-aisled church in the Middle Ages and in modern times, was roofed with a groined vault in three squares. This vault rose high above the side compartments; it was 125 feet above the pavement, far higher than the nave of any English cathedral, and nearly as high as Cologne and Amiens, although those buildings are lightly built, whereas no Roman structure is more massive than this basilica. The great vaults of this and the Baths of Caracalla are from six to eight feet thick at the crown. The interior decoration of these great halls was a mixture of styles, even more remarkable than that of the Pantheon.

There was the ornament of the vaulted roof, in panels and gilded ornaments, and perhaps mosaic, and the lining of the walls with splendid marbles; and there was also the curious use of columns and pilasters and horizontal entablatures, employed as mere decorative appliances. Figure 29 is a partial restoration of the Tepidarium of the Thermæ of Caracalla, intended to show its real construction and the way the ornamental architecture is applied. Modern familiarity with this use of architectural members ought not to blind us to the essential novelty of it when introduced in the buildings of the Roman Empire. The Greeks in their buildings, which were all post-and-lintel structures, had indeed used at times, for ornament, a mere semblance of upright supports and bands resting on them; but these were used in connection with actual post-and-lintel construction, as a natural and obvious kind of decoration. The Roman structures which we are now considering are absolutely without any use of the separate vertical post or of the horizontal beam or lintel: they belong to a class of constructions which were at first really, and which remain in appearance, *arched;* that is, they consist wholly of vaults and their supports, those supports being always very heavy piers and walls of homogeneous masonry. The Roman princes and governors had Greek artists at their command, and the Greek was always a thinking man who had ideas and the spirit of realistic design: those artists would have worked out a system of decoration for the Roman massive-vaulted halls, as they did later for the Byzantine light-vaulted churches. But the Roman administrative spirit had taken up the idea of

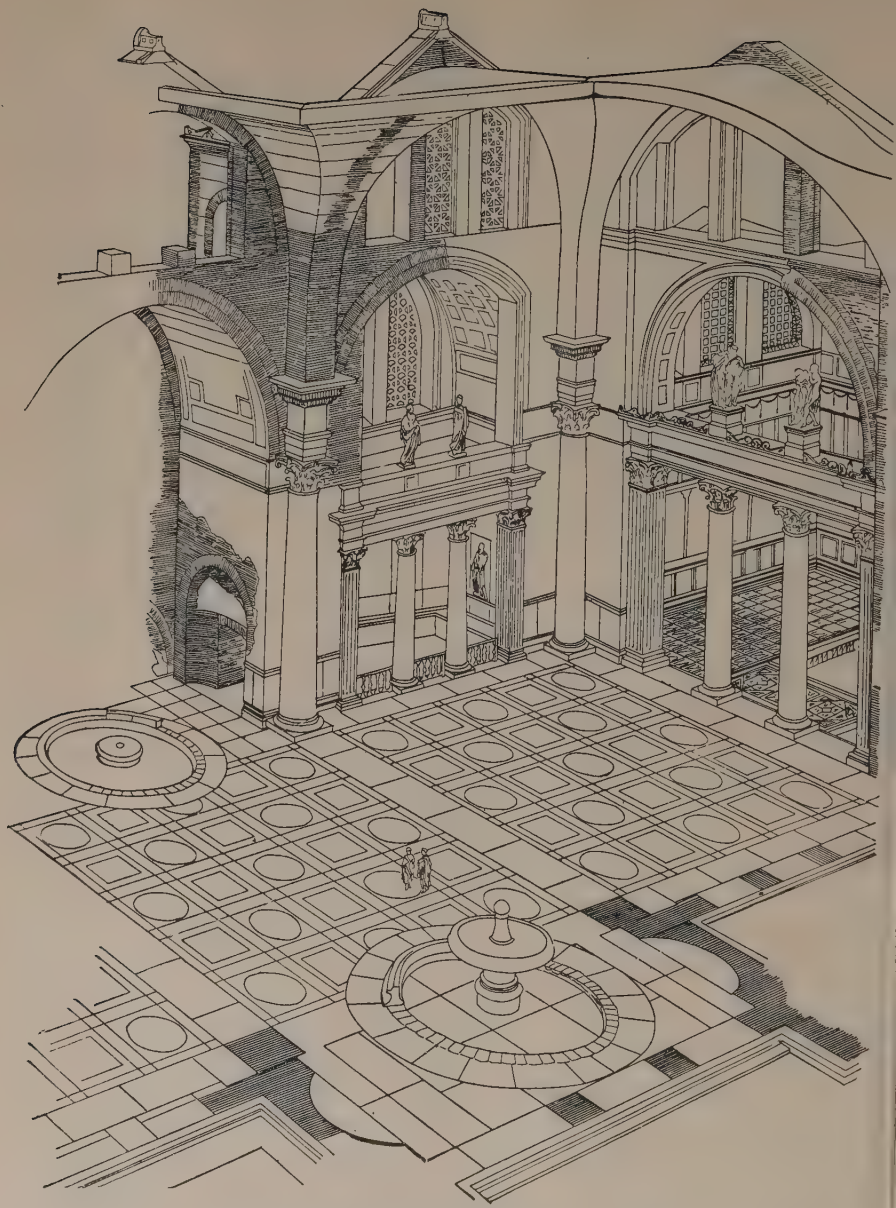


FIG. 29. Rome: Thermæ of Caracalla. Built about 215 A.D. Viollet-le-Duc's restoration of the great hall (Tepidarium).

ornamenting by means of a simulacrum of Greek post-and-lintel building, and nothing else would do. Accordingly, in either of the great halls under consideration, where one of the groins of the high roof starts and where two of the groins start together, a column with its entablature complete, and sometimes a pedestal for it to stand on, was put in. Figure 30 shows the church of Santa Maria degli Angeli, made by enclosing separately a part of the Baths of Diocletian. The great granite columns and pilasters are the original ones, but, as the floor was raised when the church was fitted up, the seeming bases of the columns are only of wood adjusted around the splendid granite shafts. The entablature and the capitals are repaired in places and pieced out with plaster, but there can be no doubt of their being parts of the original structure. There is only the bare whitewashed vault overhead, without the mosaic or the coffering which once adorned it, but except for this we have here a characteristic Roman interior,—the only existing example which can give the intended effect of a large and stately one, roofed with groined vaulting.

Less extensive vaults were used in buildings of many sorts. The corridors in the great amphitheatres offer examples of barrel-vaults, miles in extent. It is noticeable that when two corridors meet, it is generally so contrived that one is so much lower than the other that the vaults do not intersect, but that one vault is kept lower, so that it pierces the wall of the higher corridor. It appears that the Roman builders wished to avoid the meeting of any two vaults of unequal width, or of any vaults at any angle but a right angle; and as the meeting corridors could

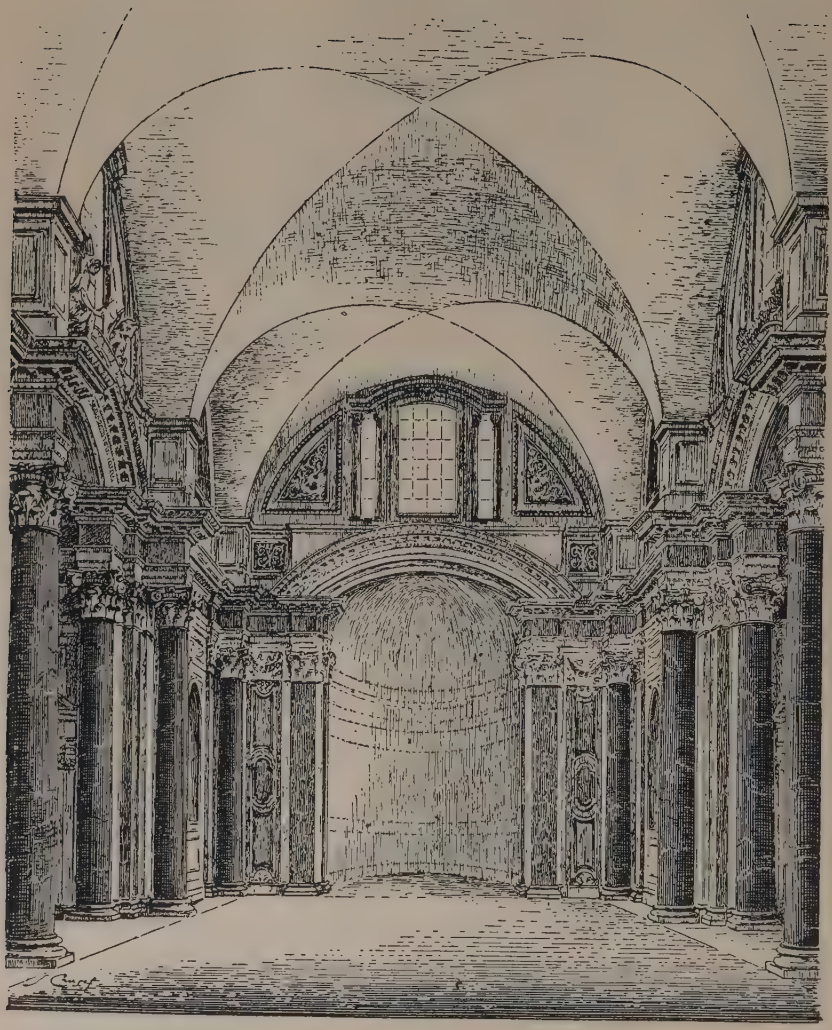


FIG. 30. Rome: Baths of Diocletian. Built about 290 A.D. Great hall restored in sixteenth century as church of S. M. degli Angeli.

not always meet on these conditions, the vaults were kept out of each other's way.[1] Larger barrel-vaults were used to roof the temples, Greek in general outside appearance, but very Roman within, with which the cities of the Empire were adorned. Some of these were of considerable size. The double temple near the Colosseum, a long structure with an entrance at each end and two apses back to back, supposed to be the temple of Venus and Rome, built by Hadrian, has a width from wall to wall of about eighty-eight feet; but free columns stood along the walls, and must have supported the vault, which, accordingly, may have had a span of about eighty feet. An equally large vault once covered the throne-room in Domitian's palace on the Palatine Hill. Other halls, nearly as large, among the city of imperial palaces on that hill, are easily understood even in their ruined condition as having been vaulted either with groins or without. The Thermæ of the Emperor Julian at Paris, behind the Hôtel Cluny, still contain a hall forty feet square covered with a groined vault, and a similar hall which must have been roofed with a barrel-vault. In the Baths of Diocletian are many halls still preserving their roofs, apart from the church of S. M. degli Angeli. Smaller vaults are to be studied in *Le Sette Sale* and other rooms of the Baths of Titus near the Colosseum, in the small temple or tomb outside the gate of S. Sebastian, and called the church of S. Urbano, the so-called Grotto of Egeria (really a Nymphæum) in the same part of the Campagna, and in similar ruined structures all

[1] See Romanesque Architecture, Chapters III. and IV., for a different practice.

over Europe and western Asia. In short, nearly all the vaulted buildings throughout the Empire were built of rough masonry in one mass, faced either with brick or with small roughly dressed stone. The exceptions are apparently those buildings only for which large blocks of cut stone were really more easy to come by than brick and cement in great masses, with workmen enough to handle these materials to advantage.

II

For it is to be noted that this system of building in the solid monolithic mass is not available except where abundant means exist. A large number of workmen and an immense supply of cement, sand, bricks ready made, and wood for centres and moulds were needed, and had to be safely at hand before the work on such a structure should begin. Wherever stone good for cutting was to be had in abundance, it might happen that buildings wholly of such stone would be easier and cheaper to erect than the simpler and generally cheaper structures of brick-faced rubble masonry. Thus in Syria, the many buildings discovered and described by the Comte de Voguë are situated in a land where excellent stone is easy to procure, and where transportation of other materials must always have been difficult.[1] These basilicas and government houses are generally roofed with wood, and in some cases with

[1] Roman cut-stone building was generally done wholly without mortar, as was also the Greek practice. If, however, mortar were used at all in such structure, the amount needed would be very small.

slabs or flags of stone laid flat on walls carried by arches (which is not vaulting in any proper sense), but where the smaller rooms are really vaulted this is done commonly in cut stone worthy of the Etruscans. It is less easy to

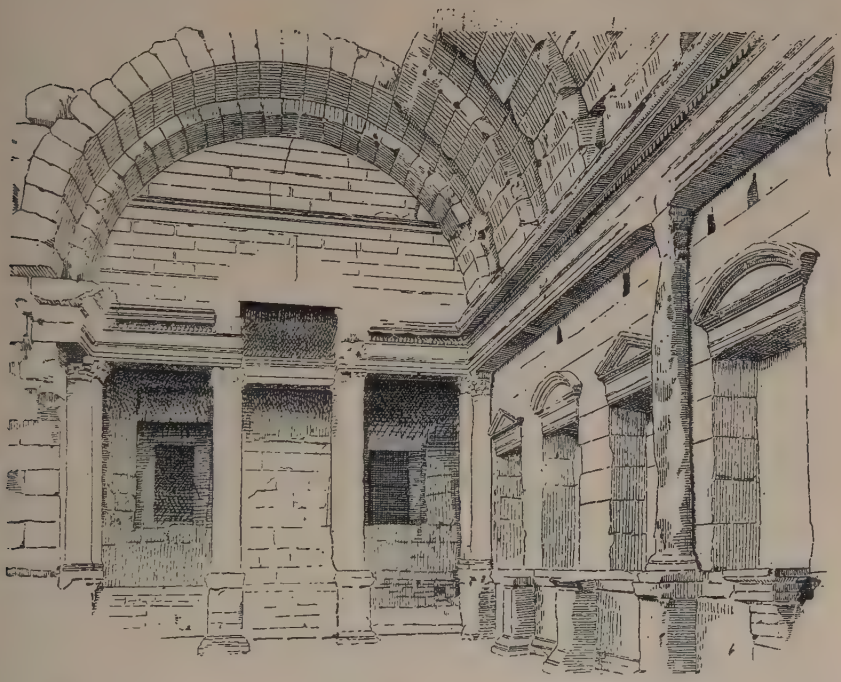


Fig. 31. Nîmes, France: so-called Nymphæum. Built about second century A.D.

understand the cut-stone roof at Nîmes (see Fig. 31). Here the barrel-vault over the Temple of the Nymphs[1] is standing in tolerable condition; it is entirely of cut stone in large pieces, and is made up of separately built arches upon which stones have been laid, filling the open spaces

[1] Formerly called the Baths of Diana.

between (see Fig. 32). This is a system of building often used for bridges; perhaps the designer of the Nîmes vault was a bridge engineer, and his system, although hardly vaulting in a strict sense, might be made to produce admirable interiors. Another form of cut-stone vault is found in buildings in Syria. Here, in districts where stone is extremely common and all other materials difficult to obtain, groined vaults and cupola-vaults were cut and set from materials like those of the Nîmes barrel-vault. Here, too, barrel-vaults were used in combination as freely as in Italy, but in buildings of very different plan. The Pretorium at Musmiyeh, undoubtedly of the time of Marcus Aurelius, though it is possible that the vaults were partly rebuilt two centuries later, is shown in Fig. 33 as it was drawn by M. Duthoit about 1870. It will be seen that the building has a square shape below and a cruciform shape above; that the short arms of the cross are roofed by barrel-vaults, reminding one of those at Nîmes, and that the smaller square in the middle of the cross was roofed by a square cupola.

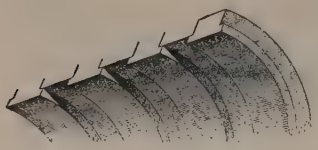


Fig. 32. Detail (see Fig. 31).

But although vaults were only by exception built of cut stone, the exteriors and the interiors of many Roman buildings were so built, from the beginning and down to the time of Constantine. The Roman world never wholly forgot the traditions of the earlier Italian races; and the admired example of the Greeks must have been always in mind. Cut stone or marble was used for some few monuments as

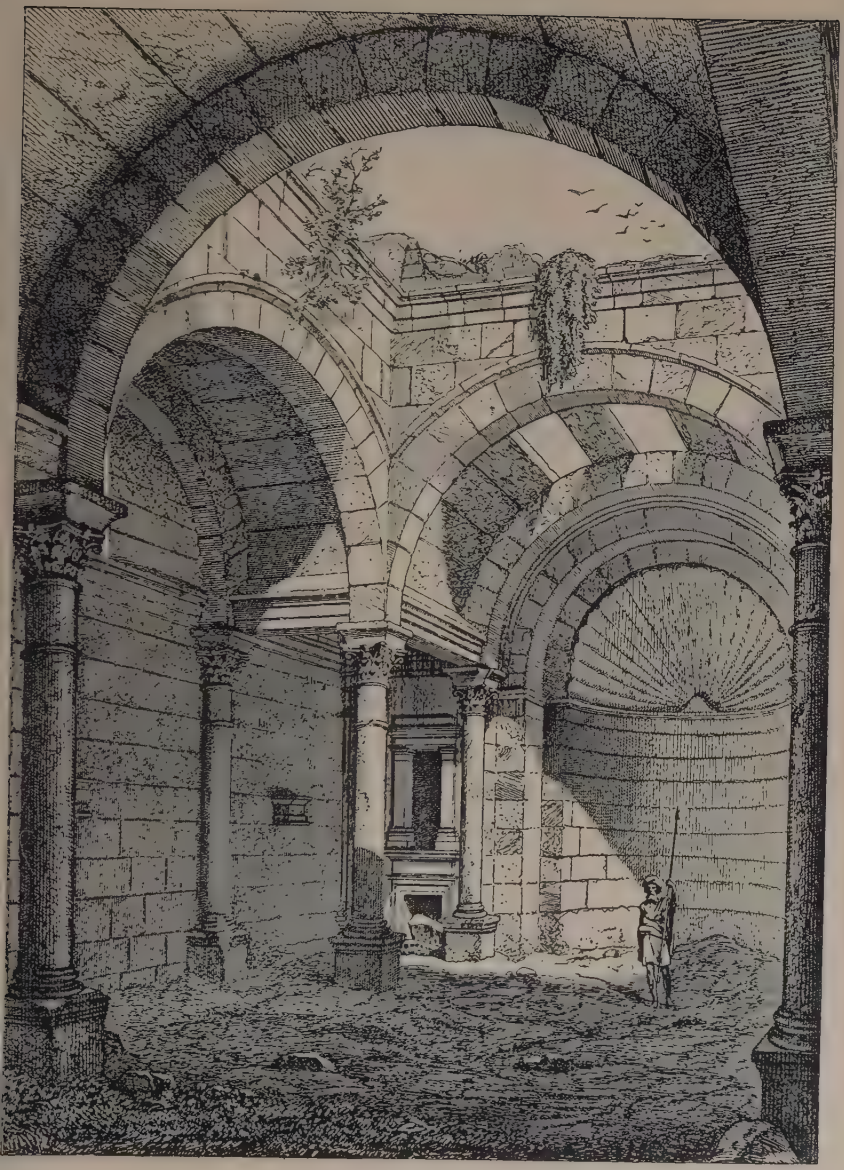


FIG. 33. Musmiyeh, Syria: so-called Pretorium. Built about 170 A.D.

the only material, and for many as an outer or an inner facing. It is to be observed that when cut stone in large dressed blocks was used, it was generally without mortar of any kind, the blocks set one upon another with carefully worked beds, allowing of an almost invisible joint. Such a stone facing exists in the great amphitheatres, such as the Colosseum, and those of Verona, Nîmes, Arles, and Pola, first in the exterior ring wall and then in the principal inner walls, the facing of corridors, etc.; in the theatres, such as that of Marcellus in Rome, that of Orange, that at Pompeii and the Odeion at Athens; in parts of the imperial palace buildings on the Palatine Hill, in parts of those temples which have a vaulted roof such as the temple of Venus and Rome, above described, and in bridges and aqueducts. The round tombs of the neighbourhood of Rome, of which the best known is that of Cæcilia Metella, described in all the guide-books, are built in this way, almost solid cylinders of masonry, faced with cut stone in large blocks. The great mausoleum of Hadrian, made, by means of a superstructure added in the Middle Ages, a fortress of some strength and called in modern times *Castello Sant' Angelo*, or castle of the Holy Angel, is such a structure, on a gigantic scale. It differs from the smaller ones in having several rooms in the mass of its upper part. The tomb of Cæcilia Metella has had mediæval battlements added, to make it serve as a fortress somewhat in the same manner: the one and the other were finished originally by conical roofs, or perhaps by concentric steps, giving a general conical shape. It will be seen that it is almost impossible to

make a decided classification here, for some of even the amphitheatres are almost wholly built of blocks of stone. It is probable also that many parts of the great Thermæ and of the Basilica of Maxentius, and other structures which are now left mere masses of rough masonry, were originally faced with cut stone, and that the facing-stones have been carried off as from a quarry. A distinction must be observed between such stone facing as is here treated of, thick, built with the mass of the wall, or even in advance of it as an important part of the structure, and the marble veneer put upon the lower part of the outer wall of the Pantheon (see p. 58). The latter was put up after the building was complete, and secured to an original brick facing: it differed from the marble lining of the interior of this and many buildings only in being thicker.

III

Of buildings built almost wholly of cut stone or marble except for the roof, having little mortar masonry about them, and therefore approaching Greek simplicity of structure, the chief are those temples (by far the greater number) which were not vaulted, and some, perhaps most, of the basilicas. A basilica was a more or less enclosed portico; sometimes walled like a modern hall, sometimes open but for screens between the pillars which carried the roof. In small towns they were small; that at Pompeii, of medium size, was about 70 feet wide by 200 long, with a central nave and an aisle on all four sides of it. We are told that these appeared in the Roman Empire only as

Greek influence grew there. Under the emperors, immense and splendid ones were built in Rome, such as the Basilica Ulpia, built by Trajan, between the Capitoline and the Quirinal hills. In these basilicas there may or may not have been an outer enclosing wall, or such wall may have existed in some places if not in others; and

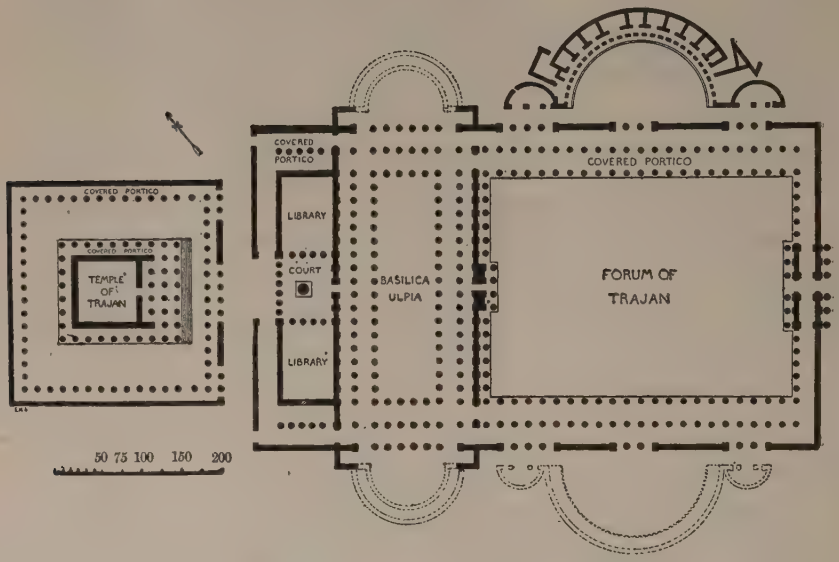


FIG. 34. Rome: Forum, Basilica, and Temple of Trajan. Built about 110 A.D. Restored plan.

such outer wall, if it existed, may have had masonry of small stones with mortar or concrete in its substance. But the building was chiefly a columnar structure. The character of the edifice being mainly that of a great covered promenade (*porticus*, like the Greek *stoa*), it consisted almost wholly of columns carrying a wooden roof. In the case of the Basilica Ulpia (see Fig. 34) the porticus

was enormous, comprising 108 columns, ranged in double row on the four sides of a great inner space, which may have been unroofed, but was more probably roofed with trusses of timber. That is to say, the rectangular space within the outer boundary, whether this was marked by a solid, weight-carrying wall or by mere screens between the columns, was about 165 by 365 feet; the middle of this, about 75 by 275 feet, may have been open to the sky, but was probably covered by a roof raised high above the other roofs, with a clear-story wall in which were windows; and finally the belt, 45 feet wide, on every side of this, was divided into two aisles by rows of columns. This, then, was Grecian building in the main, if not wholly. It may be noted that the name appropriated to these structures was Greek also, Stoa basilica, or basileia, "the royal portico." All that took the eye was the majestic distribution of columns of Oriental or African granite or other splendid material, with rich Corinthian capitals, and above these, marble architraves carrying ceiling-beams, or sometimes wooden girders only, forming part of a gorgeously decorated flat ceiling. It is all Greek building, adorned to suit a wealthy community which preferred splendour to simplicity.

The temples, most of them, were designed in the same way; at least above the foundations. In temple building the example of the Greeks would naturally be followed, for the south of Italy was full of Grecian Doric and Grecian Ionic temples. It is altogether probable that many temples were built in the different Italian states after their conquest by Rome, and that these buildings were of a

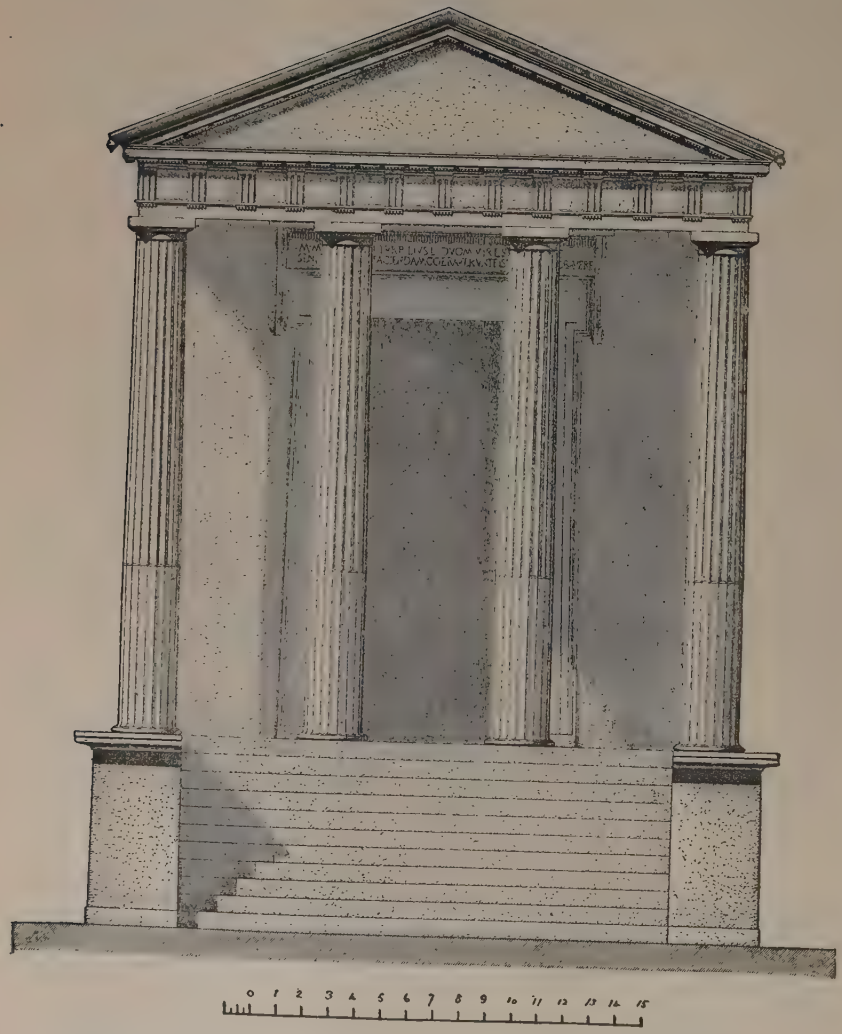


FIG. 35. Cori, Italy: so-called Temple of Hercules. Built about 80 B.C.

transition style. One example remains for us at Cori, southeast of Rome and very near Velletri. The front of this temple is shown in Fig. 35, and it will be seen that the Grecian Doric has been modified in a very curious way, — delicately and with refinement.[1] This building is thought to be of the time of Sulla's dictatorship, or about 80 B.C. The finest Roman imperial temple of which any

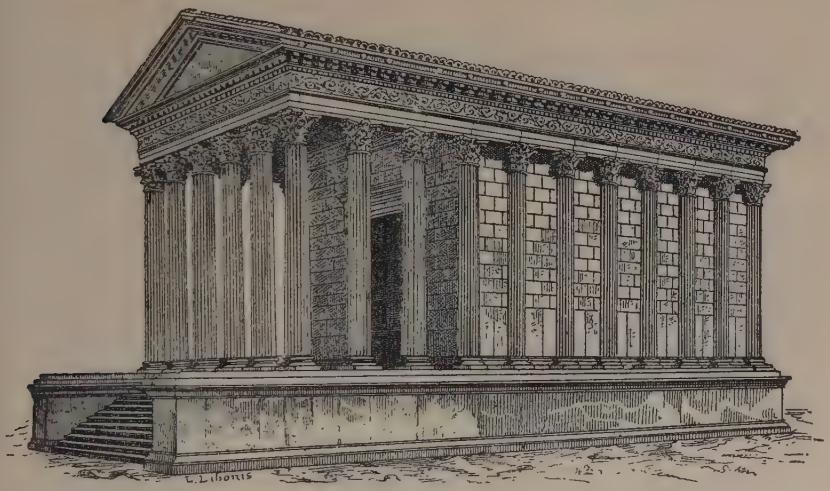


Fig. 36. Nîmes, France: *Maison Carrée.* Built second century A.D.

important parts remain is the *Maison Carrée* at Nîmes. This is almost intact; it is a Corinthian temple, about ninety feet long including the portico, resting on a podium or high substructure (see Fig. 36). The portico of six columns on the front and four in return on the sides is free; the cella is about thirty-five by fifty feet within, and is roofed with wood. Engaged columns decorate the

[1] See also the profile of the capital, Fig. 12.

outside of the cella, and these are made to range with the free columns of the portico. The whole is in refined style, and not without great beauty even in its present condition.

Recent examinations with careful measurements, by Mr. W. H. Goodyear, have revealed the unexpected fact that what seem the long straight lines of the stylobate and entablature are curved, but not in vertical planes, as are

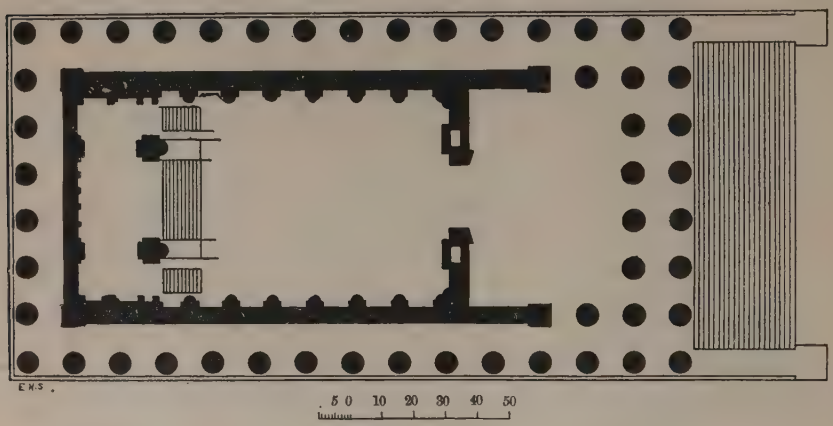


FIG. 37. Baalbek, Syria: Temple of Jupiter. Built second century A.D. Restored plan.

those of the Parthenon. The Roman temple has horizontal curves; its plan is not a true parallelogram, but each of the long sides curves outward slightly. Here is refinement which Roman art has been thought not capable of. Similar in plan, though without the engaged columns, are the temples of Antoninus and Faustina in the Roman Forum. The temple of Vespasian, near it, of which only a few columns remain, and the temple of Fortuna Virilis, near the Tiber, are similar in plan, but of the

Ionic order. The ruins of scores of temples of this general character are known, such as the hexastyle Corinthian one at Assisi, the tetrastyle one at Tivoli, and several at Pompeii. Indeed, Pompeii, with its half-dozen prostyle temples scattered about the half, or less than half, which has been uncovered of a small seaside town, serves to show that these shrines were as numerous as the churches in modern Italian cities.

The temple of Jupiter at Baalbek or Heliopolis in Syria is nearly twice as long and twice as wide as the *Maison Carrée*, but is much ruined. An approximately accurate plan is given in Fig. 37, and from this it will be seen that the building was peristylar and octostylar, and fifteen columns in depth, with no engaged columns breaking the smooth exterior of the cella wall; the entrance, however, is adorned by a double row of columns. A most curious feature of this peristyle is this, that the shafts of the outer row of columns are everywhere smooth, while the six of the inner row of the portico and the two which stand within, at the end of the wing walls of the entrance, are fluted. As a separate inner epistyle projects from the cella, resting upon these eight fluted columns, it appears that the deep portico was considered as a kind of pronaos, a vestibule to the naos or cella, and in that capacity received a special decoration. In other respects this is a most elaborately adorned building. The slightly curved roof of the pteroma is deeply carved with a most unclassical looking pattern in hexagons, lozenges, and triangles, with heads and busts in the larger spaces, and the architrave of the great door is extremely rich. On the whole,

the work shows good taste; the Corinthian capitals are of great beauty. The interior of the cella of this temple

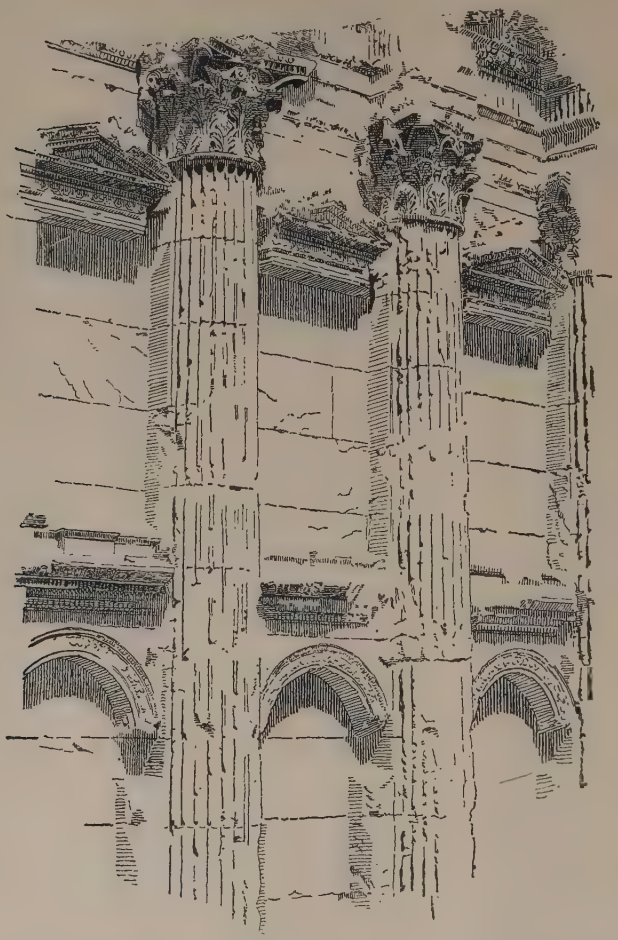


FIG. 38. Baalbek, Syria: Temple of Jupiter. Part of interior wall of cella.

is adorned with Corinthian columns in one order, and between them niches in two rows (see Fig. 38). The

temple of Castor and Pollux in the Roman Forum was also Corinthian, and with a complete peristyle of columns, and also a pure columnar structure. Such another was the temple of Augustus at Ancyra. There is no doubt that the lost temple of Trajan and that of Mars Ultor in the Forum of Augustus, and that in the Forum of Nerva, were also peripteral. In fact, this form, as the more splendid, would naturally be given by admiring senates and town councils to deified emperors. The magnificent temple of the Olympian Zeus at Athens may be considered a Roman structure, because completed and probably almost wholly rebuilt by Hadrian. This was octostyle and dipteral, and must have been of the very first rank for beauty and magnificence. The few circular temples of which anything is known were also peripteral. It is customary to speak of these as all dedicated to Vesta, but this is unwarranted. Half the columns of such a round temple still stand in Rome near the lower Tiber bridges; another in somewhat better preservation is at Tivoli. The well-known Serapeum at Pozzuoli preserves some traces of its former beauty. Remains of a round temple of Vesta have been found in Rome near the Forum, and connected with the home or palace of the Vestal Virgins. The general type of these buildings is a cylindrical cella surrounded by a peristyle in the form of a circle. A curious exception exists in Baalbek.

The temple at Rome now called the Temple of Concord, which once stood behind the arch of Septimius Severus and at the foot of the huge and high building which faces the Capitoline Hill on the Forum side, was different in

plan. Here a cella with the entrance in one of its long sides, and with windows, was entered through a porch less wide than the cella. The great Temple of the Sun at Palmyra was entered in like manner in one of the long sides. And we are reminded by these of the Etruscan temple plan, which was often square. It would appear that the famous temple of Jupiter on the Capitoline Hill was entirely Etruscan in plan, with three doorways; perhaps having three shrines side by side under one roof. Our general idea of this temple is derived from a fine bas-relief of the time of Marcus Aurelius Antoninus, now in the Capitol Museum, Palace of the Conservators. This bas-relief represents the emperor making sacrifice, and in the background is the front of a tetrastyle temple with widely spaced columns and three separate doors.

The discussion of the basilicas and the Græco-Roman temples leads inevitably to that of the great decorative colonnades, peristyles, and periboloi, which made splendid so many cities of the Empire. Those of which the most extensive remains exist are at Palmyra and at Jerash, the ancient Gerasa, in Syria. The Palmyra colonnade ran through the town from northwest to southeast, three-quarters of a mile, with others crossing it. It formed a great central avenue lined with these sixty-foot columns on each side, and having, in parts at least, four rows of columns enclosing three passages. A heavy entablature crowned these columns; but the site has been so little visited and the archæological exploration has been so slight and untrustworthy that it is not safe to say whether there was an upper passage-way or gallery, or any roof.

Near the centre of the long colonnade an arched structure marked the crossing of the chief side colonnades, and a similar very stately archway closed the colonnade on the southeast, near the great Temple of the Sun. Each of the columns was made of several drums of uneven length, and one of these drums was worked with a projecting bracket, perhaps for a statue or bust (see Fig. 39). Many of these columns still stand erect, with their load, and these form the most important part of the beautiful panoramic view of Palmyra from the Hill of Tombs. Another street of columns, Ionic in style, existed at Gerasa, and this opened into an extraordinary semicircular or semi-elliptical place, an agora or forum, surrounded by similar Ionic columns.

These partly standing porticoes and peristyles help us to understand such architectural compositions as Trajan's Forum in Rome, the plan of which is well known (see above, Fig. 34), although its superstructures are immeasurably less well preserved than those of the two Eastern cities. The Forum proper, or open place surrounded by a peristyle, was entered by a renowned triumphal arch long since destroyed; and from this was entered the Basilica Ulpia, which has been considered above (p. 72); the small square open place surrounded by galleries two or three stories high, from which the famous pillar of Trajan, which these structures enclosed, could be studied in its details better than now; the two libraries that flanked this small place, and the temple of the deified Trajan with its sacred enclosures beyond. The basilica formed one part of a series of more or less open porticoes,

FIG. 39. Palmyra, Syria: Part of the great colonnade. Built probably third century A.D.

all alike used for walking and meeting under the shelter of a roof, for business and pleasure; porticoes capable of being separated by screens of bronze, marble, or even temporarily of wood, and capable of having parts of them set off for certain special purposes at special times. Thus the semicircular apses of the basilica are supposed to have been used as court-rooms; but it is not probable that they were separated from the basilica by solid walls: low and open screens would have sufficed. Curtains, too, may have been freely used; the example of the immense sun-awnings of the amphitheatres shows how easily a staff of special officers and their slaves could see to the screening off at brief notice of any needed portion of the immense roofed space at their command. Similar open porticoes formed the outer enclosure of the Forum of Augustus, and of the Forum of Vespasian or of Peace (*Forum Pacis*). Moreover, some of the temples were surrounded by peristyles facing inward; that is, by high walls, enclosing a court or garden, and faced on the inner side by colonnades; and others were surrounded by open porticoes, consisting in their simplest form of two rows of columns carrying a roof. The temple of Apollo at Pompeii and the Serapeum at Pozzuoli are good instances of one kind; that of Venus and Rome of the other. Figure 40 shows a restoration, partly conjectural, but trustworthy, of such a temple and surrounding peristyle as those of Pompeii. This would almost exactly agree with the plan of the temple of Apollo in that town, except that a triumphal arch forms the entrance to the sacred enclosure as shown in Fig. 40.

In these great public promenades the post-and-lintel

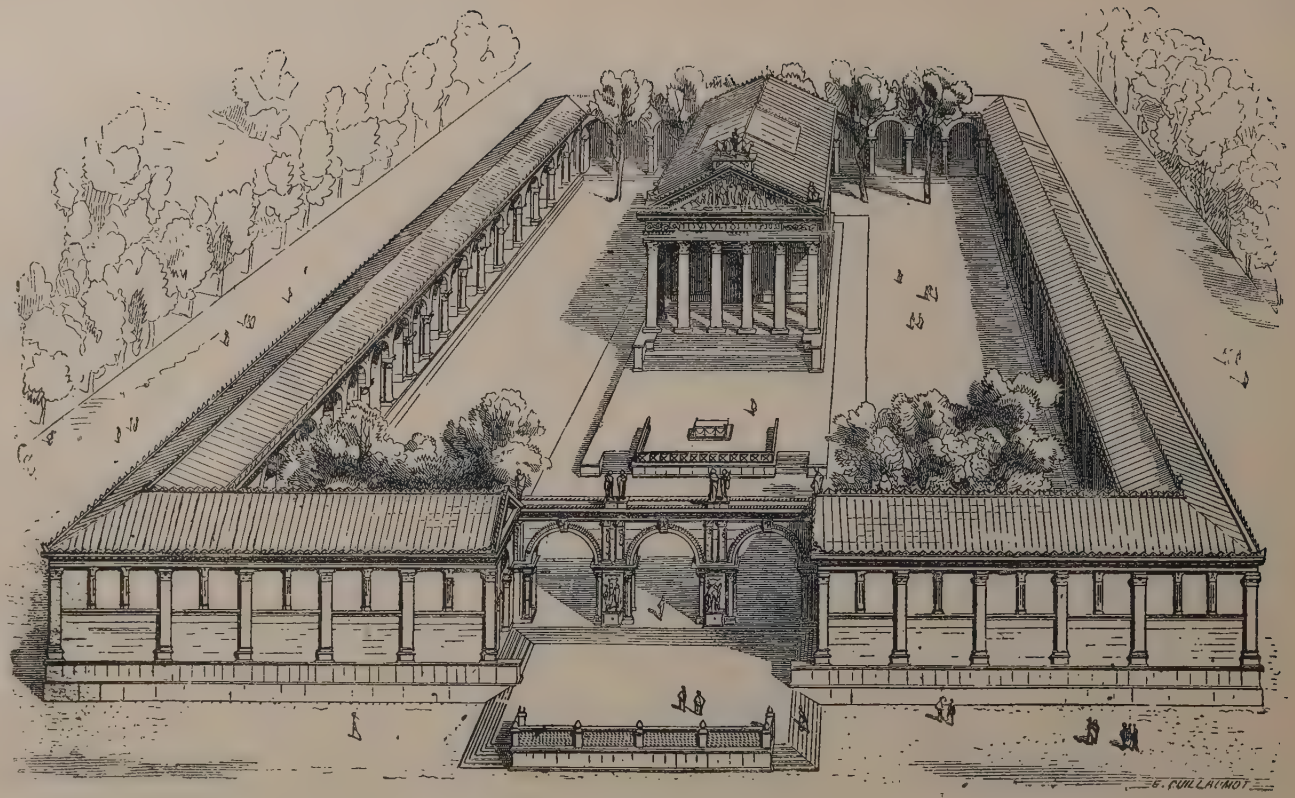


Fig. 40.

system of building reached the highest development known to us. No one feature of it ever attained the refinement of the Doric of the Parthenon or the Ionic of the Erechtheion, but, in the hands of the able Greeks whom the imperial officers could call upon, and their scholars of the East and the West, a flexible, plastic style grew up, capable of easy adaptation to many of the needs of the great cities. And every such city would naturally present, side by side, structures of the genuine Roman sort, containing large closed halls, rooms and corridors vaulted in mortar-built masonry of small stones, and decorated with a pseudo-structural display of columns and entablatures, and other structures which we may properly call Græco-Roman, in which the column and its load acting by mere vertical pressure were everything, in which mortar was not used for the main structure, and in which Greek modes of decoration, as by fully realized human sculpture, largely prevailed.

IV

There were also, as we have seen, many buildings partaking of both natures. Among these last there must be mentioned especially the triumphal arches — things peculiarly Roman. In these the exterior is always an elaborate piece of cut-stone work,[1] with columns and pilasters, a rich entablature, and so much attic or superstructure as will give

[1] The phrase "cut stone" must be understood as including marble of different kinds, though this is rarely used for solid walling in the city of Rome. The stones called *peperino* and *travertino* were more used there; in Pola beyond the Adriatic Sea, Istrian stone is used; in Verona a splendid red marble, as in the famous amphitheatre of that city.

a sufficient appearance of weight upon the arches and complete the design. The mass of the building is usually rough mortar masonry of the common sort, and in this one or more chambers will be found, where the thickness of the structure is sufficient. The arches differ greatly in character. That admirable monument, the bridge at Saint Chamas, over which the highroad to Aix and Marseilles

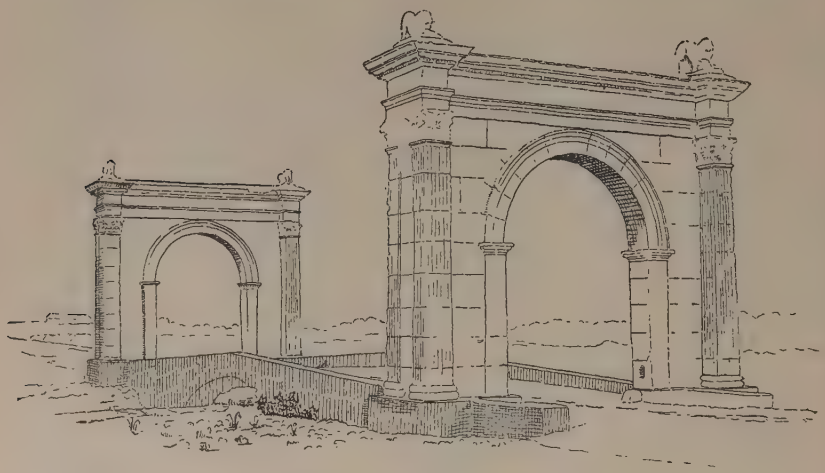


Fig. 41. Saint Chamas, near Arles, France: Bridge with triumphal arches. Built second century A.D.

has lain for two thousand years, has at each end a thin screen-wall pierced with a round arch and strengthened and adorned with Corinthian columns (Fig. 41). These are examples of the simplest form of a triumphal arch; a wall with a gateway in it, where no gate is needed for defence or enclosure, and decorated with architectural details and with sculpture. Almost as simple is the Arch of Hadrian at Athens; though this, indeed, partakes of the

nature of an entrance to an enclosure.[1] The most elaborate form is that seen in the Arch of Septimius Severus in the Roman Forum, about eighty feet wide and nearly as high, twenty feet thick, pierced by three archways, and with other archways leading from the large central passage to the side passages. An excellent example of the usual, one-arched type is the Arch of Trajan at Benevento in Campania (Fig. 42). This has been but little injured or repaired, and is of the best epoch of Roman sculpture. It is to be observed that the broad tops of the great arches were occupied by elaborate compositions of sculpture. A gold coin of Trajan represents what is probably the arch at the entrance of that Emperor's great forum (see Fig. 34): it shows on the top a six-horse chariot with two persons in it, and six colossal statues besides. That triumphal arch appears as a high and broad decorative construction with many columns or pilasters with niches between them, and but one rather small archway of entrance. None at all like that have been preserved to us. Triple-arched examples exist at Rome (that of Severus, as above, and that of Constantine) and at Orange in France, and at Palmyra, though it is doubtful if this is a triumphal arch with a special dedication or merely a showy gateway leading to one quarter of the city. There are also some town gateways, more or less architectural in treatment: three-arched, as at Nîmes and Reims in France, and at Verona, Aosta

[1] A view of this arch is given below (Fig. 47). The original design is not perfectly understood, and the question of whether the arch formed a gateway in a continuous wall is in dispute. Inscriptions on the two faces show that it was considered to mark the boundary between the old Greek city and a new Roman quarter.

FIG. 42. Benevento, Italy: Arch of Trajan. Built 112 to 114 A.D.

and Gerasa; two-arched, as at several of the portals of Rome, and at Autun and Trèves. There is also at Rome the very curious structure known as the Arch of Janus Quadrifrons — a nearly cubical mass pierced by two barrel-vaults which cross one another, so that it presents four archways in its four faces. Single-arched triumphal arches in fairly good preservation exist at Rome (Arch of Titus, much rebuilt, that of Gallienus, that of Drusus, and several

gates where aqueducts are carried across streets and the like, of less moment); at Benevento, as described above; at Ancona; at Rimini (though this is thought to have had smaller side passages); at Susa and Aosta in Piedmont; at Pola in Istria; at Athens, as described above; at St. Remy, Carpentras, Cavaillon and Besançon in France; on the bridge of Alcantara in Estremadura and at Baparra in Salamanca; at El Kasr, in the oasis of Dakhel; in the ruins of the ancient Bulla Regia, Tunis; and at Tebessia in Algeria. With these should be named the beautiful two-arched gateway at Saintes, in France (see Fig. 46, below).

V

After the triumphal arches in importance come the other monumental structures of the Romans; and upon some of these great pains and great sums were expended. They have lost much of their charm in losing their surroundings. Thus the Trajan column at Rome formed an important and calculated part of a great composition (see the general plan, Fig. 34). The Antonine column was very similar to the former, and is evidently a copy or imitation of it, unless both are copied from some lost original; this also stood in architectural surroundings of fitting dignity, in connection with a large temple dedicated to the deified Marcus Aurelius, and other monuments, now wholly lost, of the great Antonine emperors.[1]

[1] The temple and column of Aurelius' predecessor and father by adoption, Antoninus Pius, were immediately adjoining. Here, in the region of the Corso and Monte Citorio, must have been another series of imperial fora fit to be compared to that of Trajan and its neighbours.

These two columns are each a hundred feet high, in addition to the eighteen or twenty-five feet of the pedestal;[1] the shaft of each is of marble in several blocks, the exterior covered with a spiral bas-relief from base to capital: the capital of each is, very appropriately, a mere ring of egg-and-dart moulding below a heavy, square abacus; the base of each is a huge torus or roll-moulding, covered with a scale ornamentation of laurel leaves and berries; the capital crowned in each case with a cylindrical pedestal carrying a colossal statue. In each case the pedestal served for bas-reliefs of military glory, or Roman symbols, the sculptures of the Trajan column being still in place, those of the Aurelius column being preserved only in sixteenth century representations. In each case the shaft was covered with a long scroll of figures in relief, wound twenty or twenty-one times around the shaft in a slow spiral, and representing the campaigns and conquests of the prince. There is a certain lack of fitness in placing a portrait-statue so far above the eye, and where the full light of the sky as a background will never let its outline be seen unmarred. And the figures of the shaft less than three feet high are not to be clearly seen in the upper parts.[2] It is on the whole a noble conception and nobly carried out, except in a certain sculpturesque weakness in the bas-reliefs, which are not of the highest quality of Roman descriptive sculpture. Other monuments are much less admirable. The

[1] Part of the pedestal of the Antonine column is covered by the modern level of the pavement, and the rest has been altered.

[2] The whole of this shaft was painted in bright colours, and it is probable that these were so combined as to make the sculpture much more intelligible from a distance. Our modern experience does not enable us to judge of this.

FIG. 43. Saint Remy, near Tarascon, France: Monuments. Built probably third century A.D.

column of Cussy in Burgundy must have been interesting, but the usual type is much too nearly like a detached part of an organized building to be attractive. The very large columns at Alexandria ("Pompey's Pillar") and at Brindisi, as they now remain, without their statues and their former surroundings, are not valuable as monuments; and others, like that of Phokas in the Roman Forum, are known to be mere fragments torn from older buildings. Monuments in which some independent architectural design exists are not numerous. The one at Saint Remy in Provence (Fig. 43) is perhaps the most effective: it is also in very fair preservation. The tombs of Roman time in the East are rather Greek than Roman in design, and need no special mention here except as specimens of the complete and ready return to Greek forms whenever no practical need was to be consulted.

VI

The stone exteriors of many Roman buildings show that curious use of columns and entablatures as mere ornaments, to which in interior work attention has been called above. The Theatre of Marcellus at Rome gives a good instance of this, and of its complete lack of connection with the construction (Fig. 44). Here is an outer ring-wall of a very large and massive structure. That outer wall consists of piers and arches of great thickness and solidity, built as to the exterior of blocks of cut stone, in this case travertine, and probably once covered with fine stucco. The outer face of each pier is rounded out in the middle to the semblance of half a column, although the

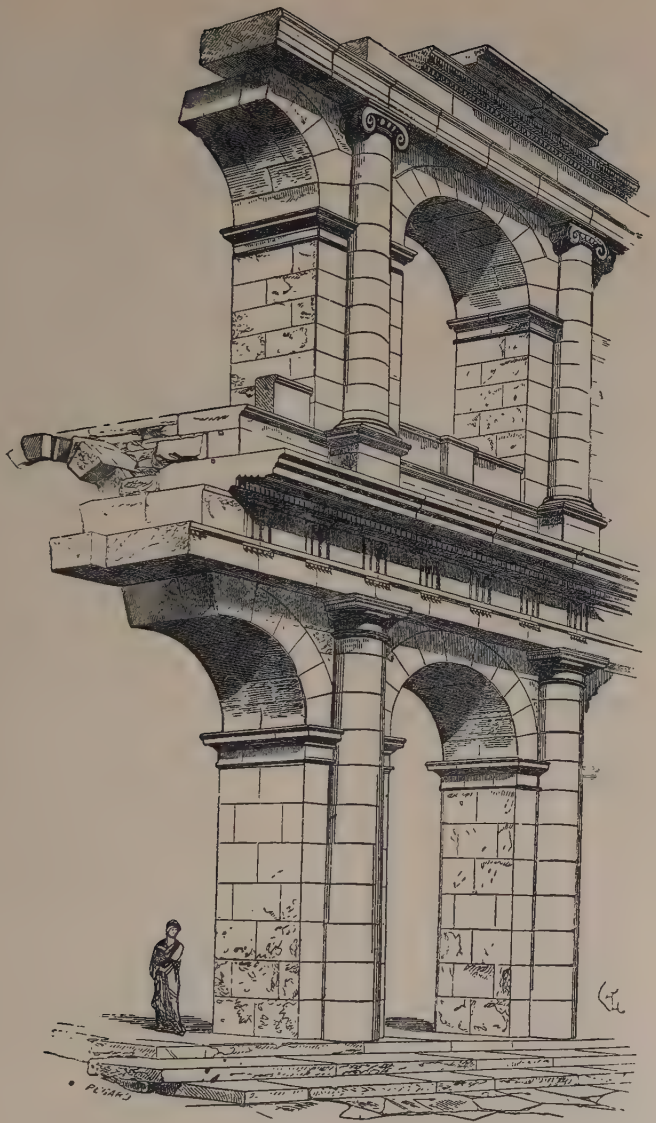


FIG. 44. Rome: Theatre of Marcellus. Built about 30 B.C. Viollet-le-Duc's restoration.

joints of the stones run continuously through it. Upon this column-like buttress, as it may be called, there is set a purely ornamental string-course, imitating an entablature, and appearing to rest upon the apparent columns, although really a part of the wall and resting on the arches. The proportions of base, shaft and capital, and of architrave frieze and cornice are those which would have been used in a temple or basilica or tomb, where they would have been parts of the real structure. It is to be observed that such engaged columns are not wholly unknown in Greek building; but, except at the temple of Akragas (see p. 42), they are extremely rare, and all the instances that we know belong to very late times. In Roman work they occur continually. They are a favourite decoration of the walls of the cellæ of temples, on the outside; and in such cases they are set about as far apart as they would be in a real colonnade. In the Theatre of Marcellus the same proportions of column to entablature are preserved, but the columns are set much wider apart. In fact, the whole composition of two adjacent columns, the entablature which they seem to carry, the two pilasters set up against the columns, and the arch which these pilasters carry, has been called the Roman Order. Often a free column with a pilaster behind it replaces the engaged column, and then the entablature has to project much more. This greater projection of a heavy, continuous, horizontal member was felt to be an objection, and Fig. 45 shows a modification of the scheme, the entablature not continuous, but breaking out in what are called *ressauts* by the French writers. This recommends itself to reason. If

the entablature is to be used as a merely ornamental band, it is well to give it emphasis at the points where the columns come, and to reinforce and give character to the capitals by this crowning of their abaci. But out of it came that very odd result seen in Fig. 29, where the entablature is set upon the capital and there alone, as if it were a necessary part of it.

FIG. 45. Rome: Arch of Constantine. Detail of the entablature, 315 A.D.

To return to the Theatre of Marcellus (Fig. 44), it should be mentioned here, in advance of the chronological sequence of events, that this decoration by means of real arches and imposts, flanked and framed by a make-believe post-and-lintel architecture, appearing in full development before the Christian era, and prevailing for not more than four hundred years, was taken up again in the fifteenth century, in direct and confessed imitation of the Roman imperial buildings, and since then has never been out of use in Western Europe. It is not to be forgotten, however, that this imitation of Roman work had primarily a literary and a social cause, and was not altogether or chiefly an agreement of artists to follow what was thought fine in art (see the chapters on the Renaissance). Still, there can be no doubt that that system of design for walls pierced

with openings which has been so generally popular for four hundred years contains elements of beauty; it tends to be dignified, serene, and stately; it lends itself to that which is the most loved by persons not very sensitive to the delicacies of fine art, the grandiose; it makes a building look costly and like a palace. And it is probable that it appealed to the Roman world in the same way; although there is curious evidence that its popularity steadily declined as the Roman world grew older (see below).

Another innovation was the free use of the pedestal. The need of this must have been evident as soon as columns invented as parts of temple colonnades were to be used as parts of civic and domestic buildings. Often it would be necessary to elongate a supporting member beyond all proportion for a column. It was natural to have recourse to a column perched upon a square block with its own crowning member and base. Still another innovation was the free use of pilasters as exclusively decorative features, to break up a blank wall into many bays. Good examples of this are seen in the topmost story of the Flavian Amphitheatre or Colosseum at Rome, and in the Temple of the Sun at Palmyra. This feature was apparently much less common than it was long afterwards, in the neo-classic styles.

VII

It has been said above that there are many instances of a rejection, on the part of the Roman builders, of what is generally assumed to be their universally adopted decorative style. These exceptions are found in all parts of

the Empire. The double gateway of Saintes in western France (Fig. 46), the arched doorways upon the bridge at Saint Chamas (see Fig. 41, above), the gate of Hadrian (Fig. 47) at Athens, the pretorium of the ancient Lambœsis at

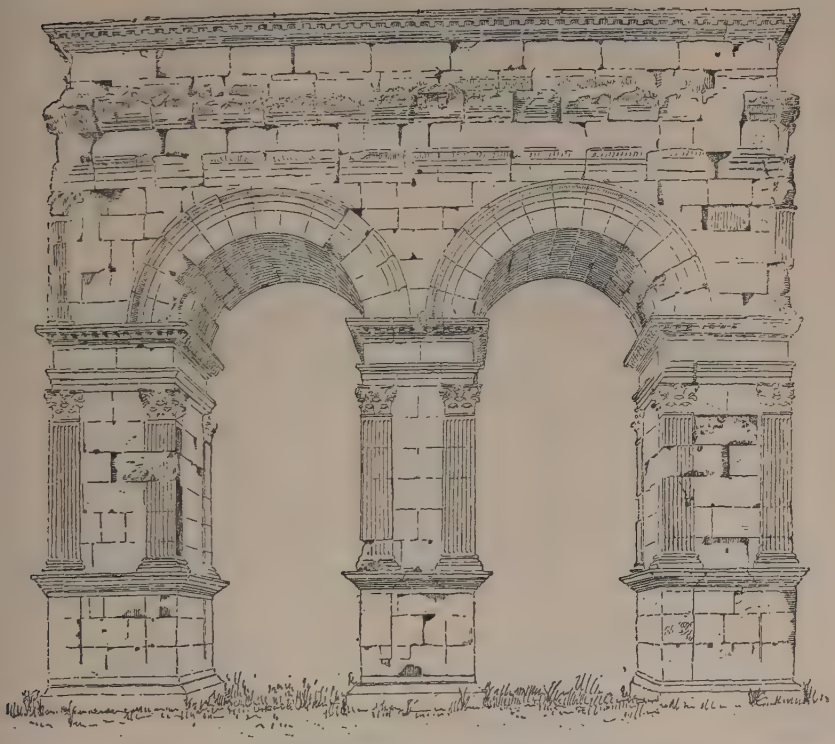


Fig. 46. Saintes, near west coast of France: Gateway formerly standing on Roman bridge. Built first century A.D.

Lambese in Algeria (Fig. 48), the city gate of Perugia, and those of Autun, Trier (Trèves), Verona, and Rome itself are instances of this constant tendency to break away from what may have been the orthodox Augustan style, —

the style recognized in the capital. The Basilica of Shakka and the pretorium or palace at the same place, engraved and described in the Comte de Voguë's book, are not later

FIG. 47. Athens, Greece: Gateway of Hadrian's quarter. Built about 120 A.D.

than the middle of the third century A.D. No doubt the great officers of Aurelian saw them both complete, and that warlike emperor may have visited them himself during his campaign against Zenobia, which closed in 273. In

these two structures the system of building in cut stone spoken of above (pp. 66 ff.) is carried out completely, and here there are no engaged columns, no pilasters used for

FIG. 48. Lambese, Algeria: Pretorium of the ancient Lambœsis. Built second century A.D.

decoration, no entablatures pretending to be part of the structure of the edifice: everything is designed according to the needs of the builders and the conditions of the structure. A similar style of building in nearly con-

FIG. 49. Spalato, Dalmatia: Palace of Diocletian. Built about 305 A.D. Arcade of great court.

temporary structures is shown in Figs. 46, 47, and 48. Certainly here the pseudo-Greek system of design is sufficiently ignored; but at the same time and in the very heart of the Empire the palace of Diocletian was built at Salona on the Illyrian coast, and in this the work of the innovator is seen side by side with the official system of design. In the south outer wall of this vast structure there is carried out the recognized formal order of orna-

mental columns carrying an ornamental entablature, while the real openings between are arches. In its north wall are columns carrying archivolts which spring directly from their capitals, and in the great courtyard (see Fig. 49) this last-named feature is repeated all along both sides, and on a great scale, while at the end is an entablature resting horizontally on the capitals of the columns, but bent into an archivolt at the middle intercolumniation. In several parts of the palace there are large columns supported on boldly projecting corbels, supporting in their turn arches above.

It is probable that this disposition to introduce varieties of design into the official Roman structures was stronger in the third century than in the first. In other words, it is probable that a new style was in process of slow and natural development. Roman archæology, in the sense of the study of the whole Empire, and not of the city and its surroundings alone, is still in its infancy, but it is probable that if the civic buildings of the third and fourth centuries, from Britain and Mauritania to the Euphrates, were compared, and their dates ascertained by inscriptions and by the comparison of one with another, it would be recognized that a late Roman imperial style was in full process of formation.

VIII

In one respect, however, the architecture as late as the middle of the fourth century showed no great change from that of the first. The orders which were used in the regular Græco-Roman style of the centre and also in this mixed

style of the Provinces were the same as those used in actual post-and-beam construction at the same time. They were, all but one, very different from those invented by the Greeks. The Roman builders are generally said to have devised five different orders: one being copied from the Greek Ionic (see p. 22), but badly copied, with much of its grace lost; another very closely copied from the Greek Corinthian, and indeed a legitimate development of it (see p. 29); two, called the Tuscan and Doric, being only partly Greek in origin; while finally the Composite was a modification of the Corinthian order. It would be more historically correct to say that the Romans found among the Etruscans an order which was very plain, an awkward modification of the Doric of Greece, and that from this the Tuscan and the Roman Doric were derived; that the Ionic order they took from the Greeks and spoiled; that the Corinthian order they took from the Greeks and improved; and that, when even this rich order proved not varied and fantastic enough, they invented a score of modifications of it, one of which we call composite. It seems to be admitted that the earliest use of the composite is in the Arch of Titus (see Fig. 50). The capitals with figures of men and animals in them, all of which are Corinthian in general character, may be taken as belonging to the Corinthian style, exactly in the same way that the composite belongs to it. Of these varied capitals, fine specimens exist in the Lateran Museum,

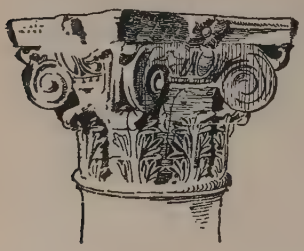


FIG. 50.

probably taken from the Forum of Trajan (see Figs. 51 and 52). A remarkable keystone in the Arch of Titus is decorated with an armed and helmeted figure holding a

Fig. 51.

globe, and a capital engraved by Professor Durm has four figures of Victory at the angles and four trophies of armour in the sides, among the leafage. All this is in modification of the Corinthian order and its variant, the composite.

The Theatre of Marcellus, built 30 B.C., is good early Roman work; the Doric order of that structure may be seen in Fig. 44. The Tuscan is a mere simplifying of the Roman Doric. It is not easily defined otherwise than as a Doric without its triglyphs and without any flutings of the shaft, although columns of early Etruscan make are apt to be fluted. No Roman buildings of any importance are built entirely in Tuscan, and but few in Doric; each of these orders is used mainly for the lowest of several stories. The Roman form of Ionic suffers greatly by the extreme thinness of the capital, giving it the look of having been pressed flat by the superincumbent weight, the volutes looking therefore as if squeezed out of the capital. A kind of mongrel Ionic is to be seen in the temple of Saturn in the Roman Forum (Fig. 53), or this might be called a composite of Doric and Ionic. The

FIG. 52.

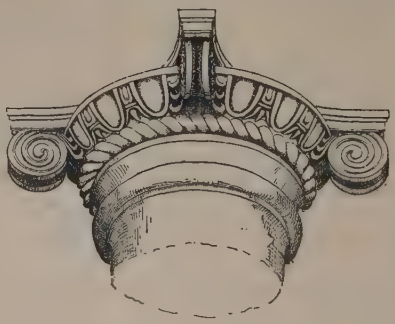


FIG. 53.

Corinthian order was the favourite one with the Romans, and it is beautiful when used as in the Pantheon. Perhaps the finest existing building of the pure Corinthian order is the temple at Nîmes called the *Maison Carrée*, and already described, although the capitals and columns of several great buildings in Rome are equally fine with those of Nîmes, and much larger. Its sculptured decoration is very elaborate, and yet it is not overloaded: it is restful; there is no Roman work known to us more agreeable or more worthy of study (see p. 75).

IX

Splendid fragments of friezes sculptured in scroll-work and in singularly free natural leafage have been preserved;

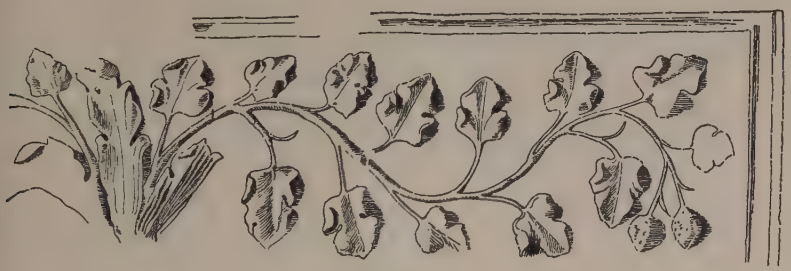


FIG. 54.

those in the Lateran Museum are the least injured, and are very accessible (see Fig. 54). It must be supposed that these were all associated with the Corinthian order in one of its many varieties.

Sculpture of human subject is, also, in Roman practice, associated with the Corinthian more than with any other

order. The broad frieze of the Forum of Nerva ("Forum Transitorium") was filled with scenes of incident and action, in high relief, and still larger figures decorated the attic above the cornice. The Arch of Benevento, built in honour of Trajan, shows large surfaces covered with bas-reliefs, arranged in two broad bands and several narrow ones (see Fig. 42). The Arch of Marcus Aurelius once bore the huge upright bas-reliefs representing the Emperor in different scenes of his official life, with soldiers, conquered enemies, and other personages. In the open arches of the great amphitheatres and between the columns of tombs, statues were set up; but these are hardly to be considered architectural sculpture. The Roman great ones were fond of statues; they brought them from Greece by thousands, and had their own portrait-statues sculptured by hundreds, but these were set up on pedestals in public and private places, in doors and out of doors, as well as in the outer walls of buildings. So far as we know Roman architecture, its sculpture was mainly in bas-relief.

It is to be noted how far this Roman practice went beyond the Greek examples in combining representative or expressional and decorative sculpture. Figures 42, 43, 51, 52, and 54 show something of this; but recently discovered stuccoes, of which many applied to walls and vaulted roofs are known since 1883, show it carried still farther, and we see in these so close a resemblance to Pompeiian and other wall-painting that it becomes tolerably certain that such figure-sculpture was common as an ornament. Many instances of it, indeed, are known, though most of the buildings and tombs where it was

found have been destroyed. The question, what development Greek architecture would have had if Greece had been peaceful and politically and socially strong, can be partly answered by studying what we call Roman art; and this is one of the great charms that that art has for us.

X

The chief merit and value of that art is, however, in its being the earliest to deal with the interior as a chief object. It was the first social architecture in the sense that it brought people together under a roof, in large numbers and for definite purposes; and that it knew how to adorn the roof that covered and the walls that enclosed them within as well as without. The contrast between the Egyptian halls, crowded with columns, or the Assyrian narrow and passage-like rooms, or the Greek rooms of assembly, small and simple or else (as at Eleusis) crowded also with columns, and the huge, permanent, vaulted halls of the Roman Empire, is impossible to overestimate. In this as in other ways the imperial days were the beginnings of modern times.

These great interiors were adorned with such semblance of a column and entablature system as has been described above, and by the richness of material in these very columns and their associated parts, with linings of walls by similar rich materials, with relief sculpture, and with painting. Wall-painting cannot be treated here (but see p. 109), and sculpture has been touched upon. The use of stones of great beauty for pilasters and columns, for the lining

of large surfaces of wall, and for pavements, was peculiarly common in the capital itself. To decorate the buildings of Rome shiploads of splendid marbles, alabasters, serpentines, and granites came from the provinces. But assuredly what was so common in the capital would be not unknown in the provincial cities. Glass was used, too, both in mere mingling of colour, as if in imitation of marble, and in relief patterns, subjects of human interest, plant form, and the like; very rich tiling in solid opaque glass. And it is to be observed that in these decorations, as in all Roman practice, to build first, and to add the decorations afterward, was the rule.

XI

A peculiarity of the Roman work was its economy and actual cheapness. In comparison with its size and mass, all the perfected building of the Empire must have been wonderfully inexpensive. The imperial architects brought together a large force of men and an abundance of choice material; they knew how to finish their structure out of hand and have done with it, and how, thereafter, to set to work in its decoration an army of plasterers, marble-workers, painters, gilders, bronze-founders and chasers, and sculptors of marble and of wood. They got their money's worth; there was but little experimenting and no delay; delicacies of sentiment and refinements of design were not their affair; they worked quickly and economically. Their custom of building first and ornamenting their buildings afterward would naturally help toward

these results. It is a curious result of this that Roman architecture has prevailed over the European world ever since 1550 (in Italy since 1450), and that the architects generally have liked nothing so much; while the archæologists of art, being students of the refined and the expressional in sculpture, and caring little for building and for the stately and the vast, give all their attention to Grecian remains. Less is known of Roman than of Greek architecture, although the Roman remains are more abundant, and are scattered over the Mediterranean world, and even as far north as England and North Germany.

XII

It is necessary to mention the dwellings of the Romans, and to state that they have not much information to give us as to the architectural art of the time. Unquestionably the way in which a Roman atrium or peristyler garden was made an architectural work of art would be of great use to our studies, if many of such buildings were preserved in tolerable condition; but so far as we know them, there are only a few stuccoed columns in Herculaneum and some mosaic-covered columns and niches found at Pompeii that can aid us.[1] A fuller study of Roman art would require careful analysis of these details.

The plan and disposition of the rooms of the smaller

[1] The Roman system of decorative painting of interiors is much better understood. Moreover, some of the paintings which are preserved suggest much concerning Roman decorative work of a more strictly architectural character, and a careful analysis of these representations by a competent architect may yet provide answers to many questions.

Roman houses is known to us from Pompeii almost exclusively. The arrangement of larger residences is to be studied at Pompeii, in the ruins of Hadrian's villa at Tivoli, on the Palatine Hill at Rome, and in the plans made from measurements underground and from inference at the famous villa of Herculaneum, where so much splendid sculpture has been found, but which still lies under thirty feet of tufa. The development of architecture depends not at all upon such peculiarities of planning, which are rather of sociological or anthropological interest.

XIII

The gigantic amphitheatres, theatres, circuses of the great Empire are to be considered somewhat as we consider the residences of the time. If we could get to know them well, — if one of them or even a small part of one of them, such as the circus of Nero, or the Circus Maximus, or the amphitheatre at Capua or that at Verona, remained in its original condition, — the aid to our architectural knowledge might be considerable. We have, at Verona and Pola, and more especially at Nîmes in France, and, so far as the mere exterior goes, at Rome, much of the original ordonnance of columns and entablatures, and a great deal of the vaulting, the walling, etc.; moreover, there is much to be seen of the masonry of the circus of Maxentius, southeast of Rome, on the old Appian Way; and these matters have been much before us in our previous enquiry. What the finished and fitted-up place of amusement would give us, if we could see it,

would be a comprehension of the Roman scheme of decoration. The low double wall of the spina, with its long platform supporting obelisks, statues, trophies of arms, and the conical metæ; the wall of the podium below the lowest tier of seats; the towering structure above the starting-point of the horsemen and chariots; the imperial box, and the topmost colonnade, which, in some circuses and amphitheatres at least, dominated the whole open auditorium, were all charged with rich ornament in marble and bronze, gilded and coloured; and much more temporary and movable ornament was added on great occasions. All this is lost, and it is only construction and the general scheme of architectural design of the exterior that remain to us of any of these great and sumptuous structures.

The tentative restorations by Gnauth, Schill, Lauser, Isabelle, Simil, and Viollet-le-Duc are of great interest to students of history, and to students of architectural art may be useful as suggestions of what may have been; but the beginner ought not to take them indiscriminately as representing ascertained fact. In authenticity they differ greatly among themselves. Older restorations — those made before 1850, to speak roughly — ought to be avoided: many of them, notably those of Canina, are absolutely without value.

CHAPTER III

THE ARCHITECTURE OF EUROPE 350 TO 750 A.D. It is everywhere the Roman Imperial Building modified by New Requirements and generally by Inferior Skill and much Smaller Resources. The Eastern Development of it called Byzantine much more Splendid and more Intelligent than that of the West.

I

The word *Romanesque* means nearly Roman or quasi-Roman. It should be used for the arts which were practised during the years of the slow disintegration of the Roman Empire, while new needs were coming into existence, new nationalities forming, and new conditions of all sorts taking shape. Logically, the architecture of the fifth and sixth centuries, both East and West, should be called Romanesque, but there can be no objection to the common term *Byzantine* used for the Eastern architecture and art which took its origin in Constantinople, and which reached its highest development during those two centuries. The word *Romanesque*, then, is more general, and applies to the art of the whole late-Roman world, from the Atlantic Ocean to the Arabian desert. Byzantine art is a branch of the Romanesque art, with very strongly marked characteristics of its own.

It has been shown in the previous chapter that even during the highest prosperity and unity of the Empire, Roman art contained within itself many local peculiarities. The Nîmes Nymphæum (Fig. 31) is an instance of buildings not of characteristic Roman imperial type, being of squared and dressed stone, roofed with vaults of dressed stone; and having peculiarities of design resulting, it is evident, partly from the material used, but more from certain influences not now to be traced. Such influences, contrary to the central imperial régime, were more free to act in Syria than in Southern Gaul, but there is a non-Roman element, a touch of mediævalism, in each. These are instances of a kind of work very common during the Empire, though more often used in parts of large buildings than in the complete construction of small ones. As for details, the buildings named in the last chapter, such as the gateway of Hadrian at Athens and the others named in connection with it, give evidence enough of a certain willingness among the imperial architects to disregard the old principle of combining a make-believe post-and-lintel structure with real vaulted building. In each of the above-named decorative structures the arch itself with its real imposts is made the important feature; in some of them there is no "order" of column and entablature at all, in others the columns or pilasters are used in a very logical way as flanking piers, exactly as the Greek builder used his antæ, at once ornamenting and making more solid the end or an angle of a wall. In other cases there are decorations of the impost; that is, they are made to form part of the solid mass upon which one side of the arch rests. They

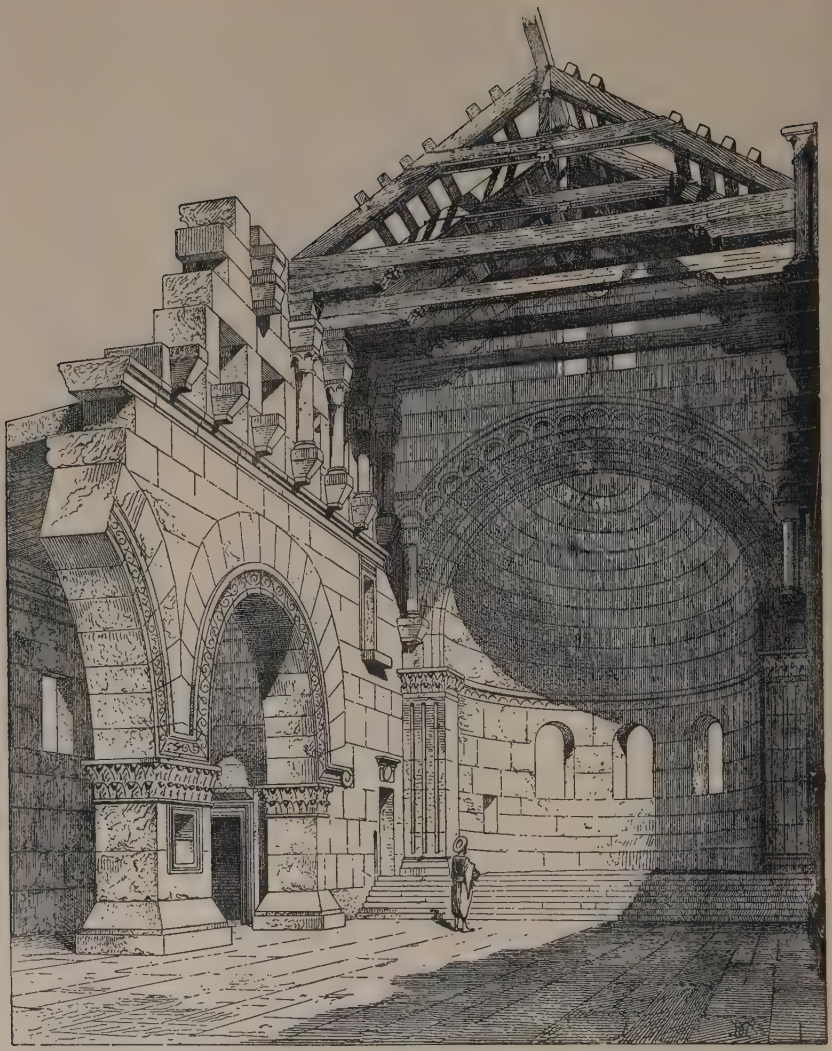


FIG. 55. Kalb Louzeh, Syria: Church built in the sixth century.

are becoming parts of the real structure. It seems to be a natural instinct of man to make his ornament and his building agree. If he has an arch, the primitive builder likes to ornament, in an especial way, that part of the wall which immediately supports it: if he has a pilaster, either torn from an ancient structure or copied or adapted from such a structure, he likes to put that pilaster in just such a prominent place as the impost of an important arch is sure to be. The extremely sophisticated work of the Roman imperial architects, that system by which the building was done by itself and done thoroughly, and afterwards the decoration was done by itself and done deliberately, ceased with the irresistible supremacy of the imperial officials. As soon as the people of the towns were left to themselves, these people of mixed races — Gallo-Romans, Græco-Italians, Syrian Christians, and the rest — began to build in a more instinctive and natural way. Where they had good stone, easy to cut, they built of cut stone, building with an arch the top of every large opening for door or window and spanning with an arch the space between each pair of pillars in a basilica; and this arch they made of dressed voussoirs, exactly as the Etruscans had done twelve hundred years before (see Fig. 55). Such an arch they would adorn with sculpture and mouldings cut in the stone, or with scroll-work around its impost; or, secondarily, by the ornamentation given to the impost itself, perhaps by setting back the wall so as to put a whole column in, as at the convent of S. Simeon Stylites, Kalat Siman; or, at the gateway of Deir Siman, shown in Fig. 56, or decorating the edge of the wall, thus turning it into an ornamental pier.

When two arches came together upon a single pillar, it would be a square pier, as in the church of Kalb Louzeh, (above, Fig. 55), or a round column, or a pier cruciform in plan or semi-cruciform, T-shape, as at the church of Roueiha, also in Central Syria. Where no arch was

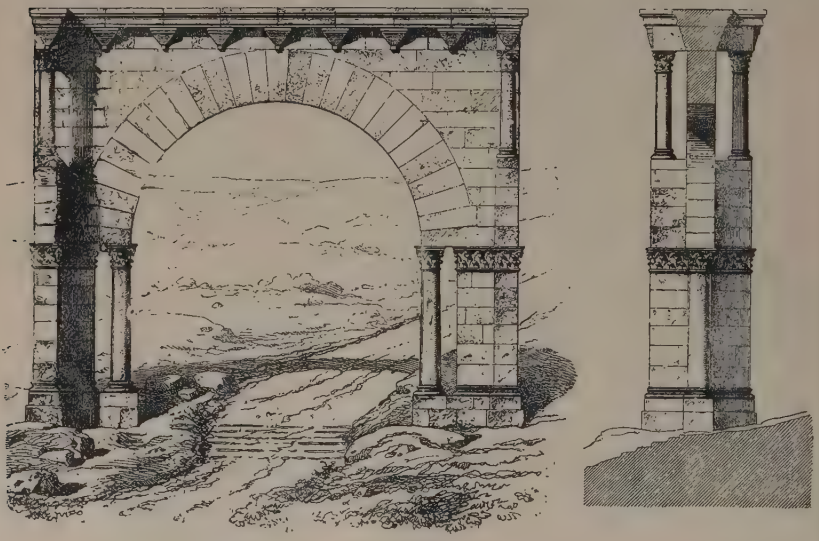


FIG. 56. Deir Siman, Syria: Triumphal arch built in the sixth century.

needed, the openings being narrow and the materials excellent, columns and lintels were used as in Greek work of the time of Pericles or in Roman temples of the time of Hadrian, but these columns did not pretend to be of any admitted classical order: they were sculptured by the native workmen to suit their own ideas (see Fig. 57). When it was thought desirable to decorate a large surface of wall which was to have few and small windows, the old motive of columns or half-columns set up against it and carrying

moulded string-courses occurred to them; this, indeed, is a favourite scheme for rich decoration wherever cut stone is being used, — but it was used in the fifth century in a very non-classical way, as in the apse of Kalb Louzeh and that of Kalat Siman (see Fig. 58). All these examples have been taken from the buildings in Central Syria discovered by the Comte de Voguë's expedition and drawn by M. Duthoit, because these buildings have never been renovated; because they have been in ruins for fifteen hundred years,

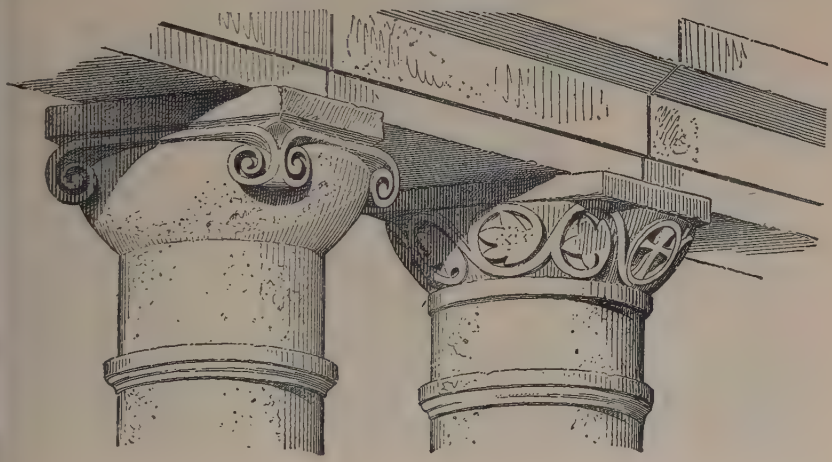


Fig. 57. Serjilla, Syria: Capitals of the fifth or sixth century.

and we can be sure of the actual date of structure and details. Chief of these buildings is the astonishing church of the convent of S. Simeon Stylites at Kalat Siman in Syria, given very fully by M. de Voguë. The building is in ruins, and has lost all its roofs, but it still shows as a complete piece of Romanesque building and decoration. The classical entablature has been completely ignored;

the archivolts of the smaller arch openings are moulded continuously with vertical bands which either stop against the sill or are returned horizontally; the larger openings have arches very richly moulded and sculptured, and these

FIG. 58. Kalat Siman, Syria: Conventual church of S. Simeon Stylites. Part of apse built in the fifth century.

arches spring from imposts which are decorated with pilasters and free columns. The church, moreover, is of great size; it consists of an octagon of 100 feet span, out of which open four arms, each complete with nave and aisles, which have stone columns dividing them and large and decorative arches in all the eight sides of the great

octagon. The total length is 340 feet, and the total width, or rather the length of the transept from out to out, is 303 feet. We have then in this church the dimensions and stately plan of a great cathedral, and yet there can be no doubt that it was built in the fifth and sixth centuries. This is the Romanesque of the far East; a splendid style destined to end in nothing.

Consider now the palace of Diocletian and the curious colonnade around the great court (Fig. 49). At the end of the court is seen an entablature which bends itself into an archivolt over one intercolumniation. Along the sides the archivolts come directly on the capitals, and there is no pretence of an entablature. Here are two attempts at something new in building: the first attempt, that of the broken entablature, though made also in many buildings of the Empire, as for instance in Baalbek in very magnificent fashion, was to fail and disappear, reappearing as a modified form a thousand years later; while the other, the resting of the archivolt directly on the capital, was destined to prevail and to be a main feature of Western architecture for twelve hundred years.

II

With these already existing tendencies toward the new and untried in decorative building was joined the demand for buildings to supply a new requirement, as indeed the Syrian churches above named sufficiently show. The Christians, when, in Constantine's time, they were first allowed to have places of public worship at will, needed what the

Roman world had never needed, — halls for congregations engaged in public worship. The Roman like the Grecian worship had required no interiors for audiences, in any of its forms; the Roman temples would have been of no use at all to the Christian bishops.[1] But the Roman basilicas, especially the smaller ones, were almost exactly what the early church required: they were roofed buildings, rectangular in form, not very unlike modern churches, of which, indeed, they are the prototypes. These could not always be spared from their civic use; but they were easy to copy. Another type of structure was more nearly original with the Christians, the round or many-sided, one-roomed structure needed to enclose the large baptismal font of the time, in which baptism by immersion was practised. The fourth century saw many of these baptisteries and many Christian basilicas built. There was not much call for new civic buildings at this epoch, for the prosperous reigns of the great emperors of the previous century had left the Empire well supplied with civic basilicas and baths, pretoria and porticoes, fortified and triumphal gateways, monuments, palaces, and temples. The supply was even in excess of the demand, for the population of the Empire was decreasing, except where tribes of emigrating Germans or Goths had been welcomed as inhabitants of the depopulated provinces, and these half-Romanized strangers did not need at once all that had been provided by lavish governors in the past.

[1] For the real or apparent exceptions see Chapter II., Roman Architecture, especially the Pantheon and temple of Venus and Rome; see also the mention of the building at Eleusis, Chapter I.

There were old buildings needing repair, or half-ruined, from which it was easy to take — often with the full permission of the imperial legates — shafts of marble or granite and delicately carved Ionic or Corinthian capitals and bases. Constantine "the Great" himself was honoured by a triumphal arch, still standing near the Colosseum, for which the sculptures of an arch of Trajan were torn from their proper setting, since no sculptors were to be found in the degenerate Mediterranean world capable of producing such work.

The earliest Christian basilicas are those of the reign of Constantine, and we know something of the original character of several of these. The largest ones, S. John Lateran and the great Metropolitan Church of S. Peter on the Vatican Hill, were finished before 335; S. Lorenzo outside the walls and S. Maria in Trastevere are of the same time, and S. Maria Maggiore was finished before 370. S. Paul's outside the walls was built before the end of the century. All these are in and near Rome; all but two were begun, if not completed, under Constantine. Many alterations have been made to these basilicas, and yet it is not hard to trace, almost without uncertainty, the original plans and the original construction of all but S. Peter's. Of this last, trustworthy drawings have been preserved. These basilicas are all of the earliest type, and their plans should be studied together in Gutensohn and Knapp's (Bunsen's) *Die Basiliken des christlichen Roms.* The plan of S. John Lateran, as it was before its renovation in the sixteenth century, is given in Fig. 59. There was often at the end farthest from the sanctuary a

large square forecourt or atrium, surrounded by a cloister, taking the place of the narthex, or in addition to the narthex. This feature took up so much room that it tended to disappear, but it has been preserved in S. Clemente at Rome and S. Ambrogio at Milan. Most of the basilicas had only one aisle on each side of the nave. In some the transept was less strongly marked.

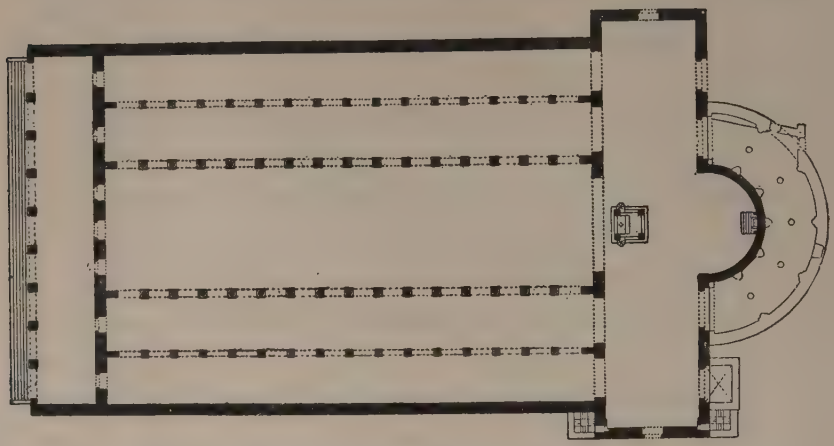


FIG. 59. Rome, Italy: Basilica of S. John Lateran. Plan of the original structure built in the fifth century A.D. Width within the outer walls about 180 feet.

On the whole, the common disposition may be stated as follows: seats for the bishop and other church officers in the semicircular apse; place for the clergy and others conducting divine service in the transept; place for the faithful in the nave and aisles, with some tendency to separate the sexes, either in different aisles, or by means of an upper gallery when one was introduced; no one not baptized admitted within the church; other persons left in the atrium or the narthex. The principal altar

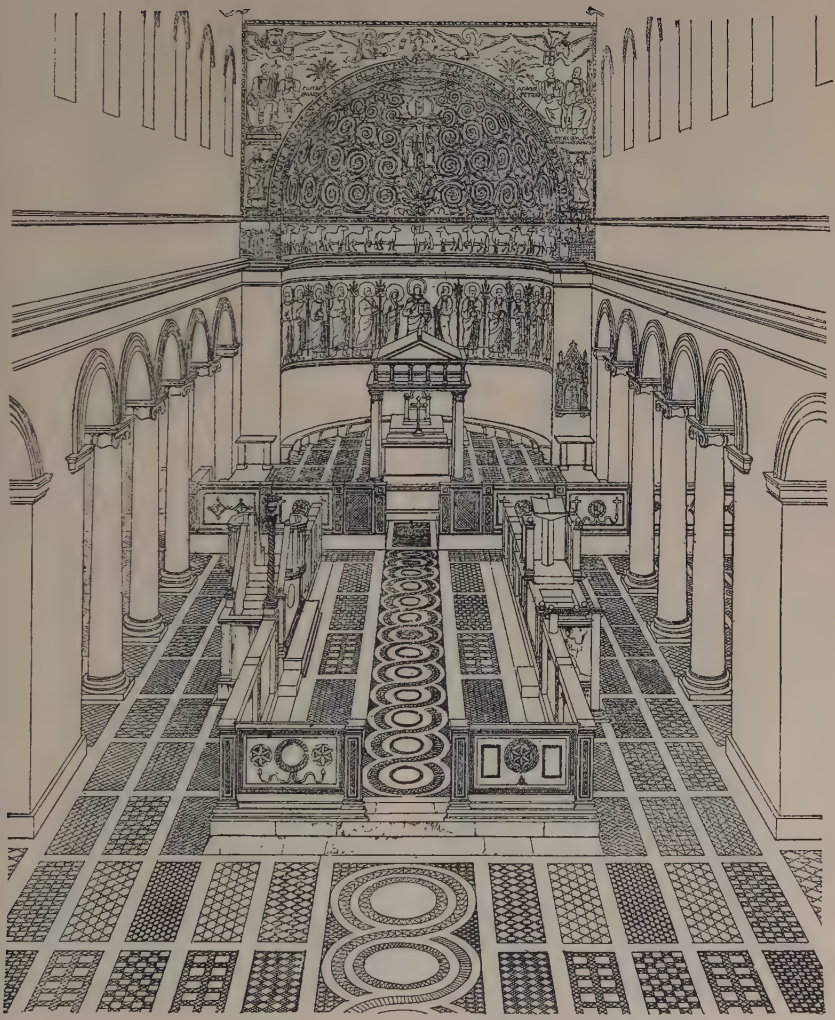


FIG. 60. Rome, Italy: Basilica of S. Clemente; as on the old plan. Rebuilt in the eleventh century A.D.

was enclosed by a railing or low wall, and the space within this tended to grow larger and to become an extensive choir or reserved place for the clergy and others who conducted the service. The interior of S. Clemente at Rome (Fig. 60) is a good instance of this early form of Christian basilica.

There was no exterior architectural effect; none was sought for. Within, marble columns and capitals were to be seen often very oddly mated, black polished marble shafts from one ancient structure alternating with fluted shafts of white marble taken from another; capitals of Grecian Doric contrasting with those of Roman Corinthian, as in S. Pietro in Vincoli, Ionic and Corinthian as in S. John Lateran; capitals too small to fit their shafts; shafts of unequal lengths, and therefore raised on pedestals of differing heights (see Figs. 60 and 64). These shafts and capitals taken from ancient buildings were almost the only architectural adornment of the interiors. The wall which they carried was sustained sometimes by round arches, sometimes by lintels; this wall was pierced with plain windows in the clear-story above the aisle-roofs, and was as bare as possible — left for the painter or mosaicist. The roofs were of timber; the trusses sometimes left visible and painted in bright colours, sometimes concealed by a flat ceiling. The interiors must have been very plain and bare, except where the walls had been painted richly, or in later times covered with mosaic, and they were full of daylight. For the general effect of one of these interiors see Fig. 60.

Contemporary with these basilicas were the round or

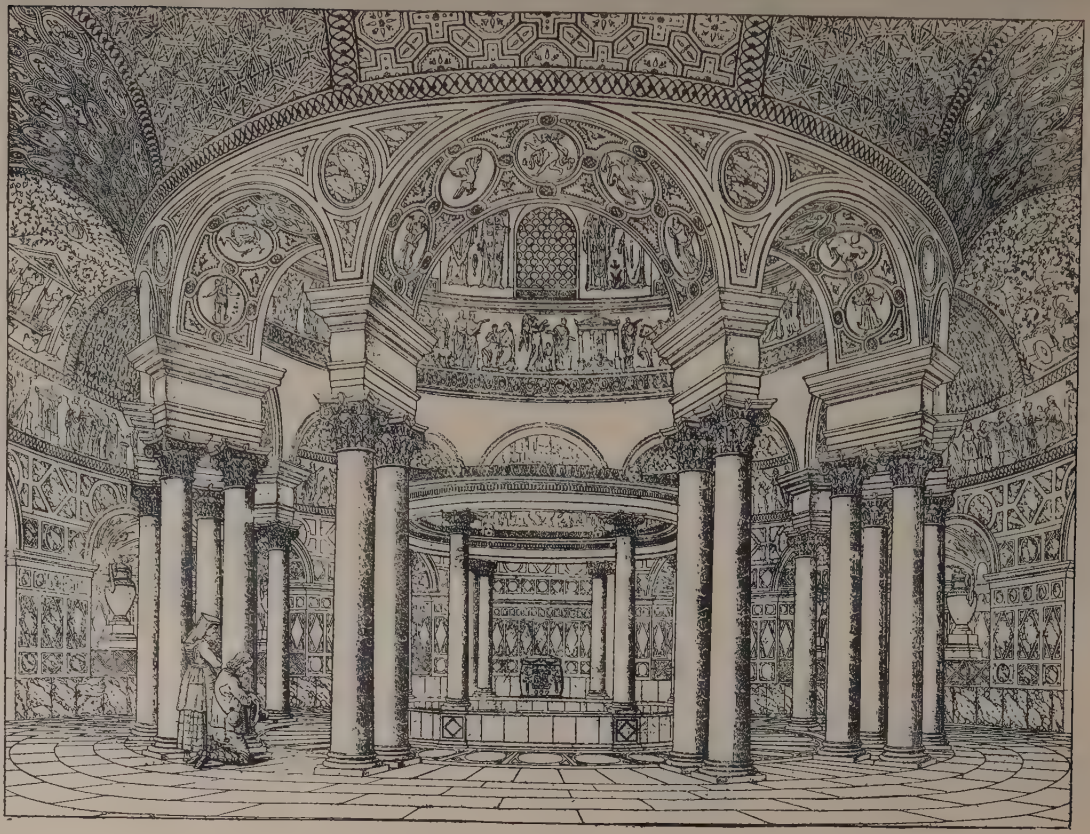


FIG. 62 (see FIG. 61).

polygonal churches, some of which were and remained baptisteries, while others, like S. Costanza at Rome, took or kept only the baptistery form (see Fig. 61). This very early church, built in the reign of Constantine and not altered in its main structure, has the nave roofed by a cupola of masonry and the aisle by an annular vault, and has no windows except those of the clear-story (see Fig. 62). The largest of all these round churches is probably S. Stefano Rotondo at Rome, built in the fifth century; but this is not a typical example. The church near Nocera, in Campania, called S. Maria Maggiore, or S. Maria della Rotonda, is an excellent example (see Fig. 63). It is to be observed that a section through the centre of one of these round churches corresponds closely to a section taken across a basilica (see Fig. 63). The circular part rises high above the aisles, and is the nave. Whether this part is vaulted or roofed with wood, it is to be considered not a tower, even when its walls rise like those of a tower, much higher than the walls of the nave of Nocera, but as the nave of a church with the aisle around it, — the nave for baptismal service and the aisle for the laymen; and it is noticeable that as these churches began to be used for other than baptismal services, a separate choir in the form of an apse was often added (see Fig. 63). Basilicas and round churches were

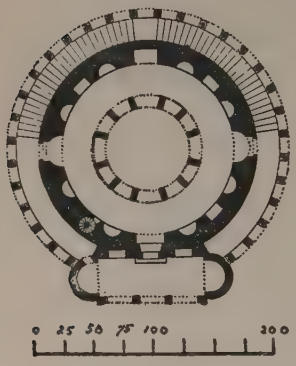


FIG. 61. Rome: Church of S. Constanza; originally a tomb-chapel. About 315 A.D.

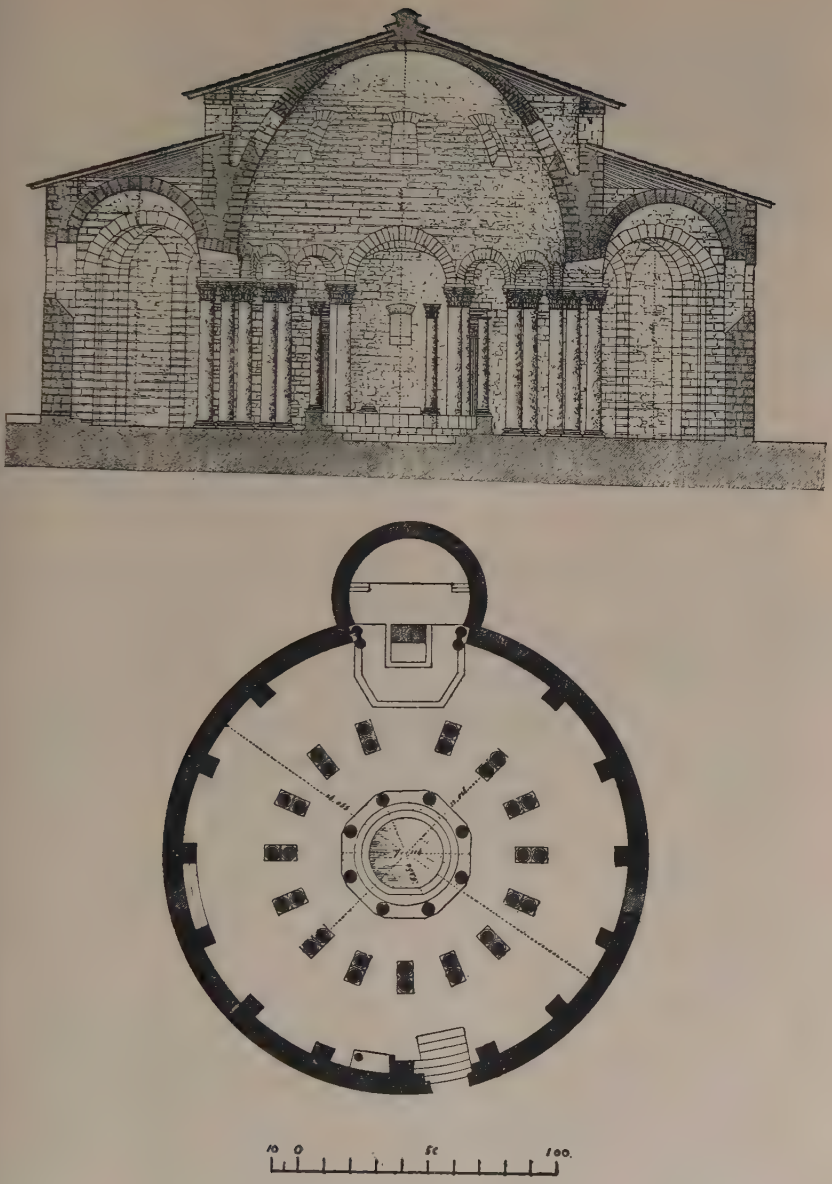


FIG. 63. Nocera, Italy: Church S. Maria della Rotonda. Built probably in the sixth century A.D.

alike built throughout the Empire during the fourth and fifth centuries, but there was a constant tendency to replace the earlier round churches by oblong and rectangular, or in other words basilica-like, structures which were naturally more easy to adapt to the needs of a large congregation. When the rectangular church was built, the round or polygonal one was kept to serve as a baptistery, as is still to be seen at the Lateran in Rome and at Torcello in the Venetian lagoon.

III

It must be understood that throughout western Europe buildings were erected without intelligent skill, with very inadequate means, and without other possible decoration than that furnished by the plunder of earlier structures. The eastern provinces, within the undisputed sway of the Emperors at Constantinople, could build, as we have seen, in a somewhat thorough and elegant fashion, but the people of Gaul, Spain, and Italy were not so favourably situated. They had to build with a roughness, a negligence, and a lack of finish difficult for us now to understand. Figure 64 from S. Lorenzo Fuori le Mura (outside the walls) shows how in a basilica in Rome itself the ancient materials taken from perishing imperial buildings were utilized,— larger and smaller Corinthian capitals, Ionic capitals, fluted shafts, spirally reeded shafts and smooth shafts, all used in the same small church. Where the ancient materials were not available, the small chapels and baptisteries were often what we should now call huts,

FIG. 64. Rome, Italy: Church of S. Lorenzo without the walls. In part of the fourth century A.D.

and the larger churches, all of which except two or three have been swept away to make room for better buildings, were, it is clear, wretchedly built. Their walls of poor material were very thick, because otherwise they would not have stood, the windows small, the roofs roughly put together of half-dressed timber from the forest. No style of architecture could arise under these conditions; indeed, western Europe was too disturbed by political changes and constant destructive wars to allow of a consistent style of architecture, and the years from about 450 to 1050 were to pass without the appearance of such a style beyond the frontiers of the Byzantine Empire. The great decorative appliance of the time, mosaic, used freely for wall pictures, is one which would naturally take shape in such an epoch. Mosaic pictures could be applied to any wall which was somewhat protected from the weather. Their beauty of colour and of grave and simple lines was one with the beauty of painted pictures in manuscripts, which constituted the most important fine art of the time. The artists, who could neither draw nor model the human figure, and who had lost altogether the secrets of Greek composition of the classical epoch as preserved under the great Empire, were still capable of decorative design of rude character; and, moreover, Byzantine manuscripts and drawings, and tracings from Byzantine mosaics, must have been brought rather freely into the West, where they would serve to stimulate design in the direction most obvious and easy. Accordingly if we could see a large basilica as it stood in the seventh or eighth century, we should see a building with plain and blank outer walls except where a fragment

of sculpture from a Roman building or sarcophagus might be built into the work, as now in the walls of S. Mark's Church at Venice. The roof of the basilica proper would be at a low pitch and covered with plain tiles, the windows of the clear-story and of the aisles would be cut through the walls without mouldings or ornament of any sort. The atrium or great court would be surrounded by a very plain covered way, — a portico or peristyle, — and the wall enclosing this on the outside would be absolutely plain, without relief or ornament. A mosaic picture here and there, with a wooden pent-house roof to protect it, would have rather the appearance of an object of worship than a piece of decoration. In the interior, the columns separating the nave from the aisles would be handsome, and even rich in themselves, but without seeming a part of an organized and carefully planned structure. The wall resting upon these, whether supported by arches or by lintels, would be without anything to give shadow or to divide it up in an architectural way; there would be no pilasters, no arcades, no mouldings around the windows, no sill-courses nor friezes of sculpture. The roof of the nave would probably be of plain squared timbers with nothing to hide them and without carving or moulding, but they probably would be painted in patterns of bright colour. Large parts of the plain wall surface would, however, be covered with mosaic of small cubes, mainly of glass; roughly worked and copied from cartoons very childish and unskilled in drawing, but not without decorative effect. Moreover, the reading-desk, the pulpit, the wall enclosing the choir, the altar, and especially the canopy over the

altar, called ciborium, or in later times baldacchino, would be more or less architectural in character, and the pavement of the church would probably be rich with inlaid marbles taken from some building of imperial times, and badly relaid.

These basilicas, however, were found mainly in Italy, so far as we know. The larger churches of the north were made more decidedly cruciform in plan, at least as early as the close of the sixth century. It appears from the descriptions of the time that their interiors were sometimes decorated with columns and wall-facings of marble; but the whole structure was undoubtedly often of wood, and in the regions of great forests they continued to be built and rebuilt in that material, even after the eleventh century. There is a tradition that even Chartres Cathedral was of wood until about 1050. Meanwhile, each bishop and abbot strove to have his church rebuilt in stone, and even to have the roofs of the same material. Among the churches in any great town one would find many attempts at vaulting the aisles, and some at vaulting the wider nave. Fear of fire, and perhaps also of robbers who might break through the tiles of the low aisle-roofs, would account for the constant effort to secure a roof of masonry. Another reason was the less dignified and less permanent look of the rough timbers, in the many cases where no good carvers and painters could be obtained. The skill of the builders was, however, insufficient, and the material resources which they controlled were inadequate. One contrivance often resorted to was to build stout arches across the nave between opposite pillars, and to build upon each arch a wall

rising in a gable: the roof timbers then rested upon these walls instead of trusses of carpenter work (see Fig. 138 A in which is shown a building of a later epoch roofed in this manner). This same device was used in Syria, but with walls less widely separated, and carrying flat stone slabs, and similar construction was to be employed a few years later in the great mosques of Cairo, Damascus, and Cordova; and Spanish churches of the fourteenth century, such as S. Agata of Barcelona, preserve the type.

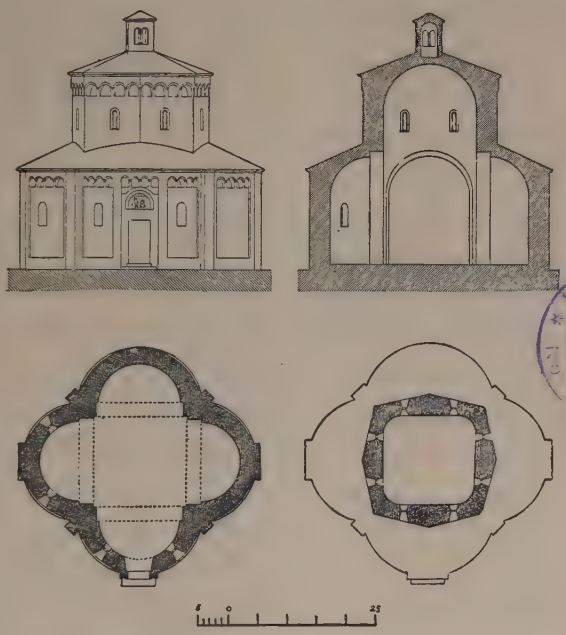


FIG. 65. Biella, Italy: Chapel probably of the eighth century A.D.

Vaults, when they built vaults, were apt to fall down, or had to be supported by props or held together by iron ties. A few cases are known to us in which greater knowledge on the part of the travelled and instructed builders, or an Eastern model to copy, or finally a small scale and a massive construction, have saved the stone roof. There are several in Italy. Thus at Biella in Piedmont, northeast of Turin, is the little structure shown in Fig. 65,

and which is vaulted in four semi-domes and one square cupola with rounded corners; but this building is only thirty-five feet in total diameter. Scarcely larger is the baptistery of Galliano near Como in Lombardy. Nothing seems to be known of the date of this little building, but it is of the same design as that of Biella, and is even less carefully built. The larger churches have been replaced by later buildings, but some of the very small ones still exist unchanged in other lands than Italy. One of these is the little chapel on one of the islands off Cannes on the French Riviera, Isle Saint Honorat de Lérins. This building is probably of the seventh century; it consists of a nave about seventeen feet long and wide, which is roofed with a simple wagon vault strengthened in the middle by a heavy arch concentric with the vault, and beyond this a little sanctuary roofed by a square dome and three semi-domes. Several other minute chapels of this sort exist, — one at Montmajour near Arles (see Fig. 66), and one at Querqueville near Cherbourg, both in France; but in the north no vaulted roof of any considerable magnitude has come down to us from any epoch previous to the eleventh century. It is evident that hundreds of buildings with Roman vaulting still intact existed in all parts of Europe in the seventh and eighth centuries. Single chambers of Roman thermæ and pretoria and even of dwellings, such vaulted rooms as may now be seen in Paris behind the Hôtel de Cluny, must have been in use, in great numbers; their vaulting protected from the weather by wooden roofs and thatch and thin walling built up where needed to enclose them more perfectly. Such a room is still to be seen at Cividale

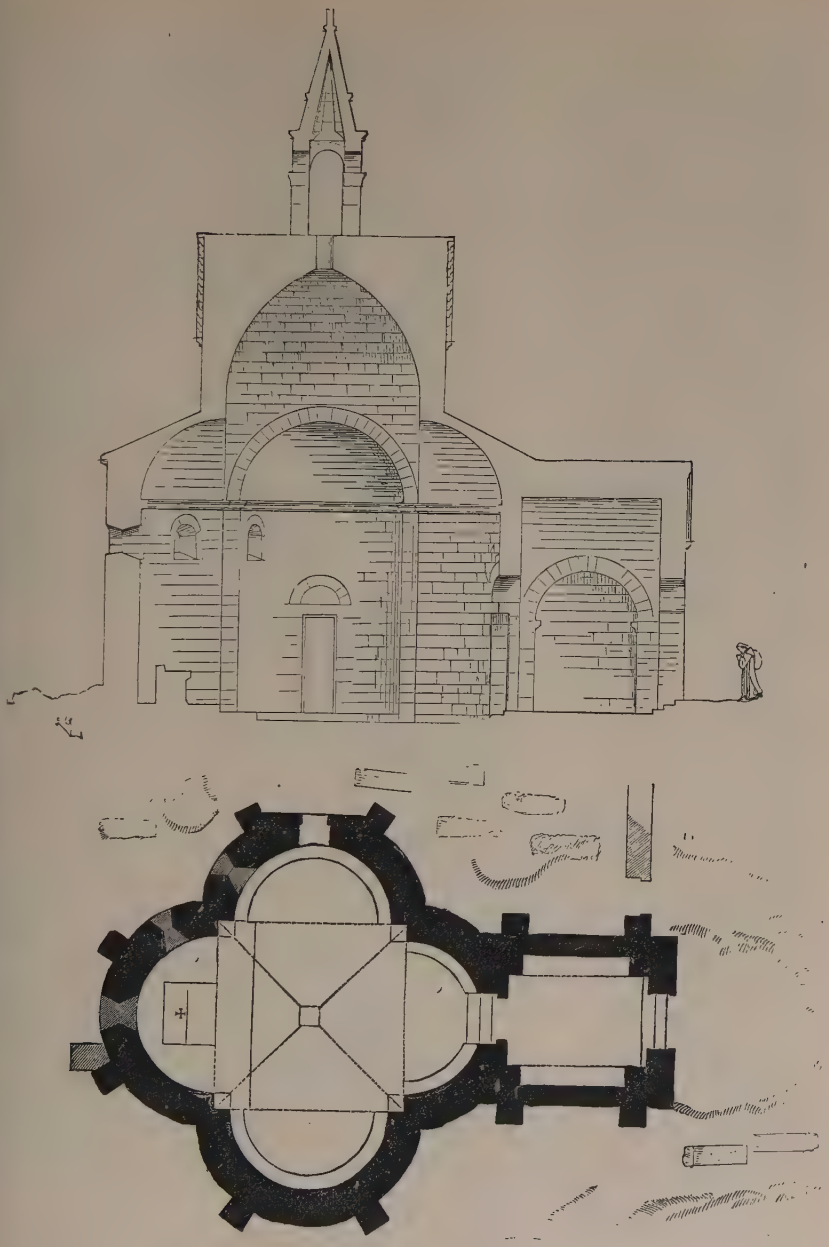


FIG. 66. Montmajour, near Arles, France: Chapel of the Holy Cross. Eleventh century. Total length over all, 51 feet.

near Udine in the extreme eastern part of Venetia, as shown in Fig. 67. It is given here as an instance of what must have been once a very large class of buildings, the churches and chapels put into shape within the remains of imperial structures.

IV

There exist, in many parts of the old Roman Empire, buildings of a character very different from those described as Romanesque in the last chapter, but known to be of the same epoch with them. If the ancient Empire is taken as divided in two by the Adriatic Sea, the eastern half Græco-Oriental in character, the western half Latin, then by far the greater number of these buildings which we have to describe are in the eastern division. Travellers in Italy recognize the difference between four or five ancient churches in Ravenna, on the eastern coast of Italy, and other Italian buildings of the early Middle Ages. S. Mark's church in Venice is recognized as having some points of resemblance to those Ravenna churches. But beyond the Adriatic Sea there are, in Constantinople, the great church of Hagia Sophia and that of SS. Sergios and Bacchos, and at Salonika the church of S. George, which are known to have been completed in their present state before the end of the seventh century A.D.; also in Constantinople the church of S. Irene and the church of the Theotokos; at Salonika, the church of Hagia Sophia, that of S. Demetrios, and that of S. Elias; at Studenica in Servia, a church; at Trebizond, the church of Hagia Sophia; at Athens, the old cathedral; and throughout these lands

FIG. 67. Cividale, Venetia, Italy: Hall perhaps Roman of the fourth or fifth century, used as a church.

of the eastern Mediterranean a host of minor churches of later or probably later date — all of which churches are akin in many important respects to the churches in Ravenna above-named. All these buildings are called Byzantine, and the style which is common to them all is called the Byzantine style. It is, as we have said in the last chapter, a form of the Romanesque, but it deserves especial consideration because of its strongly marked peculiarities, and because of the beauty of many of the buildings which belong to it. On the other hand, as it has had but little effect on later European architecture, its chief outcome being in the mosques of Cairo and similar Mohammedan buildings which lie outside of our subject, it must be treated briefly.

The great prototype of this style is H. Sophia in Constantinople, built by the Emperor Justinian and partly rebuilt by him after a fire, and finished as now in the year 538 A.D. How far this church was a new inspiration of the builders, reasoned out to meet the requirements of the Emperor that a church should be built exceeding all buildings on earth in extent and beauty, and how far it was based upon previous monuments, we do not certainly know. The buildings which had been built by Greek builders in the great cities of the eastern half of the Empire during the six centuries previous to this undertaking have perished. It has been alleged that the church of S. George at Salonika existed before the erection of the present H. Sophia, and this is probable, but the building has no boldness of design, and is a small cupola supported on a ring-wall pierced by niches. It is evident that very great credit

must be given to Anthemios, the builder of H. Sophia, and his assistant Isidoros, for their boldness and skill. It is clear that they took a longer step in advance than it is generally in the power of man to do in matters of fine art or building. Figure 68 is the plan of Hagia Sophia. The great dome is low rather than lofty, and 107 feet in diameter; it rests upon four great arches which enclose a square, the

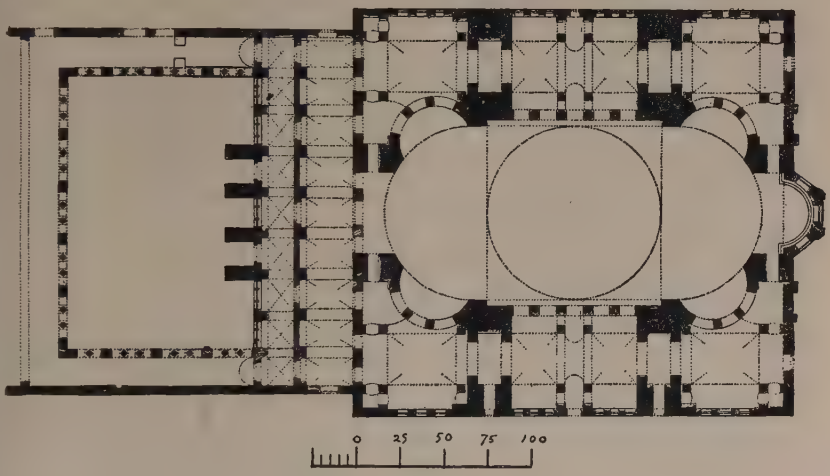


Fig. 68. Constantinople: Church of Hagia Sophia, rebuilt 566.

triangles in the corners of the square being filled by what are called pendentives. To the eastward and westward of this great square are half-domes which cover each a semi-circular drum, but this drum is pierced in each case by rounded apses, which are again covered by half-cupolas penetrating the larger ones. The great dome is pierced just above its base by a number of small arched windows, and similar windows pierce the semi-domes, both larger and smaller; in fact, a large amount of the light which fills

the interior is taken in this way through the roof. The columns shown on the ground plan have none of the work of supporting the roof. All the weight of the dome and the semi-domes and of the great arches which carry the former rests upon the great piers. The columns carry arches, which in their turn carry a second row of columns and arches. Some of these support the large semicircular walls pierced with windows, which fill the space beneath the great arches on the north and on the south, and others support the semicircles which flank the large semi-domes. The floors of galleries are carried by the walls which these minor arches support. Figure 69 is a longitudinal section of the church, which will give a slight idea of its construction and arrangement.

The smaller churches which are recognized as of the Byzantine type have many points of resemblance to H. Sophia. In the first place, vaulting is used with the greatest freedom and in great variety of form. The Byzantines are tied to no such conventional rule as that which forbade the Romans to let barrel-vaults of different spans and heights intersect one another. The Byzantine builder uses barrel-vaults of all sizes and sections, and lets them intersect as they will. He uses domes, half-domes, and cupola-vaults which are built on neither whole circles nor half-circles necessarily, but of such horizontal plan as the distribution of the church requires; like those of H. Sophia above, which break into the large semi-domes. He supports his vaults, whether cupola-shape or square in plan, either upon continuous walls or upon pendentives which, in their turn, are supported by meeting arches, or finally upon small points of support like the

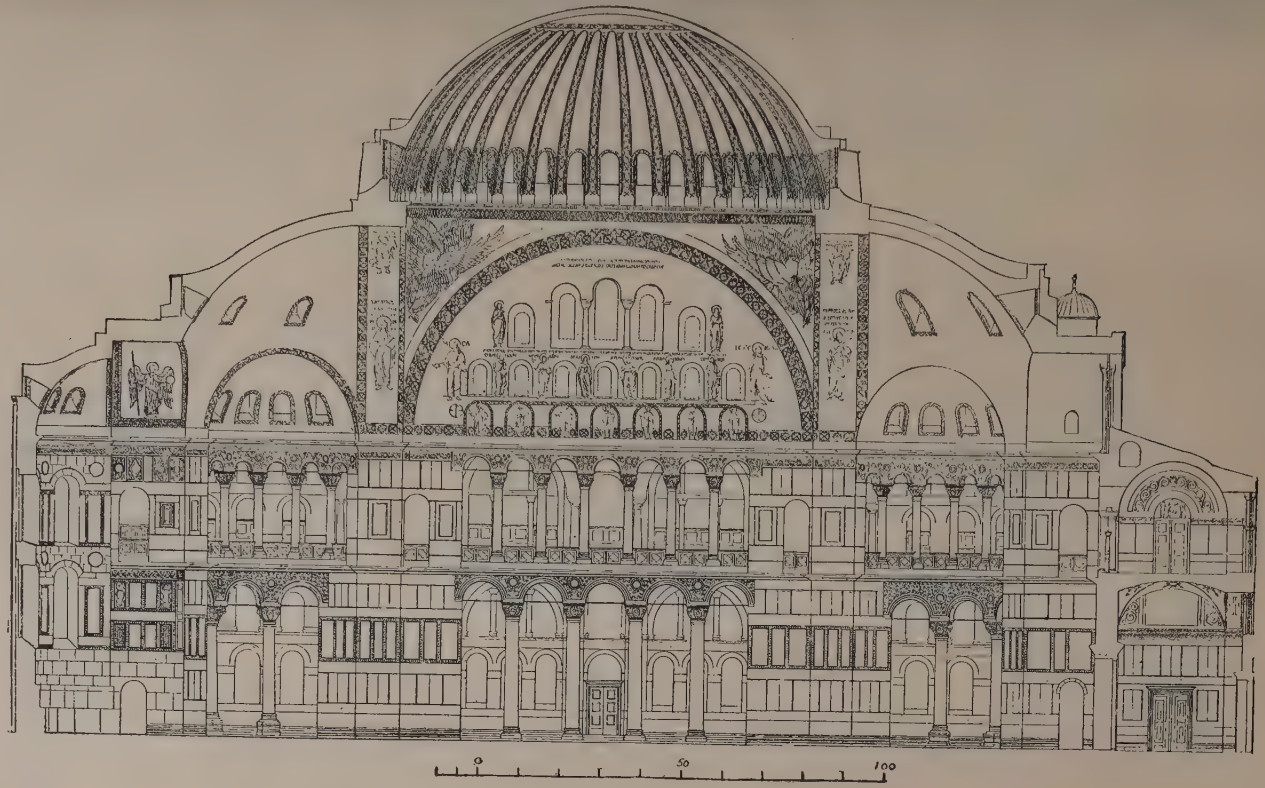


FIG. 69 (see FIG. 68).

groined vaults of the Romans, but with much greater freedom of arrangement. This freedom of his, of building in any way most convenient, is well shown in the immense covered cisterns which Constantine and his immediate successors built for the storage of aqueduct water; halls whose roofs are carried on vaults supported by slender columns twelve to fifteen feet apart, in long rows. For these vaults the builders used cut stone, brick, rough stone and brick conjointly, and hollow earthenware vessels; they built them with thin beds of mortar and, equally well, with quantities of mortar filling all interstices and making of the whole vault a homogeneous shell in the true Roman fashion; they built such vaults without centres, with only partial or guiding centres, or with full centres in the Roman way; they found means to roof every part of a complicated building with its own distinct cupola or barrel-vault or other masonry covering, — all these working together to produce a harmonious effect within.

One very remarkable result of their method of building is seen in their homogeneous roofs. The same shell of masonry serves as a ceiling within and as a water-shedding roof surface without. There can be no doubt that this result was often reached by the imperial Roman builders in the roofs of the thermæ and basilicas; but the Byzantine builders reached the same result at a very slight expense of labour and material. The builders of no other mediæval, and of no modern school, have been capable of homogeneous roofs except in a few cupolas; and now and then in buildings erected at lavish cost, or with nineteenth-century building appliances.

V

The interiors resulting from this vaulted construction were simple, with broad, smooth, unbroken surfaces of wall and rounded ceiling. There were few breaks, few projections; no pillars nor horizontal courses projecting from the smooth faces of the finished masonry and no mouldings at the angles. Even the projecting corners of the great piers rising from the floor to the spring of the vaults and the angles of the vaults above, were rounded off smoothly instead of being emphasized by means of mouldings in groups or by angle-shafts or pilasters with capitals and bases. The decoration which such interiors called for was, then, the mere beautifying of the smooth surface. For this purpose we must not forget that there were, even when H. Sophia was building, no skilled painters such as four hundred years before had been at the call of Hadrian. Justinian had the Empire from Italy to the Euphrates at his command, but he could not get men who knew how to paint and carve the human figure as the Greeks and their pupils of an earlier time had done. It is a strange and not perfectly explained process of decay, this of the artistic power of a whole world of men; but it is actual and certain, as the study of the carved sarcophagi and the bas-reliefs of Christian subject of the fifth and sixth centuries show very clearly. Mosaic, however, with its splendid effects of colour enhanced by the semi-vitreous lustre, and its rejection of refined delineation, was at the Emperor's service. His designers could make splendid decorative fig-

ures of great stateliness of pose and of some charm of outline, and the patterns of background and border were very rich. His carvers of marble were capable of beautiful scroll-work, and this could be cut in low relief in thick slabs, or could be incised in such slabs and the incisions filled in either with marbles of other colours or with plastic composition. The capitals of the columns were carved in low relief with exquisite leaf-decoration. In short, the conditions of what we call barbaric or semi-civilized art were all present: a power over ornamental patterns and brilliant colours which our modern civilization wholly lacks, considerable skill in making conventionalized drawings of the human figure, which themselves work in with the ornamental patterns and the colour composition, and finally very perfect judgment as to the use of these appliances in ornamenting large surfaces. With all this very un-Roman ornament was combined the favourite Roman device of rich material. The walls of H. Sophia are sheathed with splendid marbles, and the columns are of porphyry, *verde antico*, *cipollino*, and other such jewel-like materials, just as a palace-hall in Rome would have been adorned three centuries earlier. All of this decoration can still be admired in the church, except the figures of saints and angels in the mosaic of the vaulting, which are covered lest they should offend Moslem eyes.

Other churches were adorned by the same means, so far as they were available in each case. Marbles and porphyries must have been easy to get in Constantinople and in other great cities of the Empire. Carving in marble for capitals and slabs and inlaying upon smooth surfaces must

have been arts in constant use. Mosaic, given a new impetus by its use in H. Sophia, must have been common throughout the Eastern Empire by the end of the sixth century. Accordingly, although little has been done to gather information on the subject, churches adorned in this way are known in cities and towns throughout the Levant.

Exterior architecture, on the other hand, is extremely slight and devoid of character. It may almost be said that no exterior architecture was ever elaborated by the Byzantine builders of early date. In Ravenna, as in the East, the churches of all forms have the plainest brick outsides, without any architectural pretensions at all. In Ravenna, the "orthodox" baptistery called S. Giovanni in Fonte is an octagonal tower roofed by a cupola and having a little apse upon every alternate side, so as to have a nearly square floor; the tombal chapel of the Empress Galla Placidia, now SS. Nazario e Celso, is a small cruciform building with barrel-vaults and a square tower at the crossing; S. Vitale is a large octagonal church, the nave adorned by rounded apsidioles like those of H. Sophia of Constantinople and having a well-planned apse within the circuit of the aisles; S. Apollinare in Classe outside the town and S. Apollinare Nuovo within the walls are wooden-roofed basilicas with round campanili. All these buildings of such different shapes and sizes are of the fifth and sixth centuries; they have suffered but little alteration; they are made beautiful with mosaics of unsurpassed decorative effect and are not without more purely architectural merit, in their interiors; but their outsides are almost absolutely blank, of the plainest brick-work with openings cut squarely through it. In

like manner S. George at Salonika, SS. Sergios and Bacchos at Constantinople, the beautiful basilica of Parenzo in Istria, and the cathedral of Torcello in the Venetian lagoon with its adjacent church of S. Fosca, — all buildings of the years between 500 and 750 A.D., and little changed from their primitive form and appearance, — are as plain without as if no one had dreamed of architectural enrichment with regard to them, except that at some time mosaics have been spread over parts of the outer walls, as at Parenzo and at Torcello.[1]

The early Byzantine style is of the greatest interest to the student, and one may easily come to feel a special affection for it, as for the most deeply satisfying of all styles whose buildings are still standing for us to see. It has had but little influence upon later European work, however. Continued with but little change within the limits of the Byzantine Empire, it found its chief and most important development in the Mussulman styles of Cairo, Damascus, and Moorish Spain; which are outside of our subject.

[1] There can be little doubt that the decoration of the apse of S. Fosca at Torcello is of the eleventh century.

CHAPTER IV

THE ARCHITECTURE OF EUROPE FROM 750 TO 1150 A.D.

THE DEVELOPED ROMANESQUE; IT REACHES GREAT SPLENDOUR IN WESTERN EUROPE AND THE BYZANTINE FORM OF IT RETAINS ITS VALUE.

I

AT Aix-la-Chapelle or Aachen in the province of Rhenish Prussia stands the building which Charles the Great built as a palace-chapel; the building which gave the town its peculiar French name. This building is a round church very much like those built in Italy three hundred years before, and there is little doubt that we have it nearly intact, except that its added decoration has disappeared. It has been enlarged, a very impressive late-Gothic choir has been added to make a cathedral out of it, and chapels of still later date flank the choir; but the original round church remains, and retains most fortunately some of its bronze fittings, which show in a very emphatic way how classical the church must have been in detail. Figure 70 is a plan of the original round church. The nave is vaulted by a simple octagonal cupola. The complicated vaulting of the aisle it is unnecessary to explain; it has no close relation with the vaulting of other buildings of the epoch, but is much later in the system adopted. The church

of S. Michael in Fulda, northeast of Frankfurt-on-the-Main, built before 820, shows, in spite of later modification, its original plan. The nave is a cylindrical, tower-like structure carried on eight columns with round arches skilfully built in the rounded wall, and the aisle is roofed by a half-vault; literally the half of an annular vault, the section of which anywhere is like a flying buttress. The church of S. Gereon at Cologne has been more altered than the church at Aix-la-Chapelle, and is thought by some archæologists to have received its original form in the fifth century. If this is so, this church may have served as in part the prototype for the royal chapel at Aix-la-Chapelle, but it is as we see it now a Romanesque rotunda-like church with a long choir of later date. The rotunda, which serves as the nave, is ten-sided and of a curious oval form with chapels like little apses, reminding one of the curved projections from the nave of H. Sophia at Constantinople and S. Vitale at Ravenna; but all this unique rotunda was remade in the twelfth century, and is now a very beautiful late-Romanesque building with Gothic windows of a still later date.

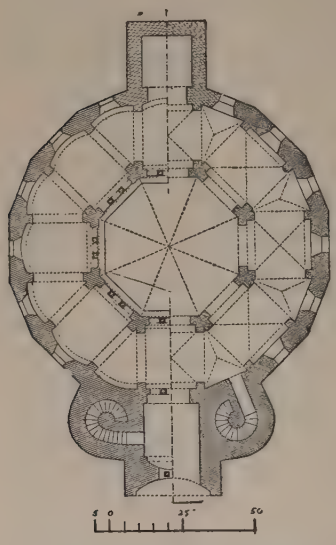


FIG. 70. Aachen or Aix-la-Chapelle, Prussia: Chapel, original plan as built in the ninth century.

It would seem that the use of the round or polygonal plan for churches of considerable size was a lingering

relic of the earliest Christian architectural epoch. The future of church building was not in this plan, but in the long parallelogram made up of nave and aisles, with choir in the form of an apse at one end, and generally turned toward the east. It is a deduction from the three-aisle basilica. Take such a basilica, as in Figs. 59, 60, 64; enlarge the apse to a length nearly equal to that of the nave, and give the transept greater length, leaving the ends square, — the whole cruciform plan of the Middle Ages is established. Take the same basilica plan, and round the two arms of the transept into apses as large or about as large as the eastern apse, so that the whole of the sanctuary end of the church is converted into a tri-apsal group (see Fig. 71). If now the square into which the three apses open be carried up into a tower rising above the other roofs, you have the Romanesque plan as seen in S. Georges de Boscherville near Rouen and in the church of S. Martin in Cologne. If the same tower be made octagon, you have the general scheme developed in the cathedral of Florence (see Fig. 166 B). Of these two principal plans, the former was destined to the widest popularity, especially during the epoch of Gothic architecture beginning about 1180; but the latter, that is to say the plan with the long nave and the short choir-group of apse with rounded transepts, was rather the favourite as long as the Roman-

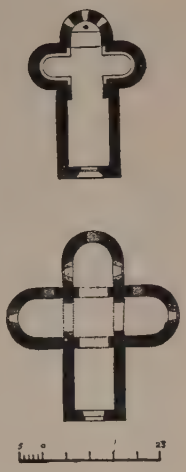


Fig. 71. S. Saturnin and Querqueville, France: Chapels of the ninth and tenth centuries. Plans.

esque or round-arched architecture prevailed in its unchanged form.

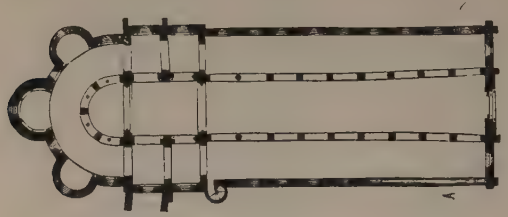


FIG. 72. Vignory, France: Church built in the tenth century. Plan. Total length, including the apsidal chapel, about 170 feet.

In this and in all other plans the difficulty of vaulting the churches was equally great. The custom was rather to vault small parts at and near the sanctuary and to leave the nave and often the aisles with timber roofs. The interior of the church of Vignory (Haute-Marne), near Chaumont, furnishes us with architectural details typical of the building of this period, in any place and time of tolerable peace and prosperity. The church has been restored, but the work was conducted by a competent and conscientious architect, Mr. Boeswilwald. Figure 72 gives the plan of this church,

FIG. 73 (see FIG. 72).

and Fig. 73 shows the interior arrangement. The eastern end of the church is vaulted in part; that is to say, the aisle on both sides and around the semicircular, apse-like end of the choir is roofed with a barrel-vault, and the apse itself with a semi-dome. All the rest is roofed with timber, like a southern basilica. The tier of coupled arches and short columns alternating with piers indicates a triforium gallery; but there is no floor of such a gallery, and the roof of the aisle is visible from below. When vaulting was undertaken, the barrel-vault was often used for even the high nave, and this was sometimes counterpoised or buttressed by the upper vaults over the aisles. Thus in the great and splendid church of S. Saturnin (S. Sernin) of Toulouse in the south of France, and in many smaller churches, the vaults over the aisles are half-barrel-vaults, as if a barrel-vault had been cut in halves, and one half set up on each side of the nave-vault so as to take up its thrust. The close resemblance of this system to the true flying buttress system will be noticed in Chapter V. Figure 74 shows the cross-section of the church of Notre Dame du Port at Clermont-Ferrand. The barrel-vault was often modified so as to have a pointed or broken curve in section, as is seen in the church of S. Eutrope at Saintes, on the west coast of France, near La Rochelle. This pointed section made the vault a little safer than a semicircular section, but it was very hard to keep in place, because of the thrust it gave all along the whole length of the clear-story wall. The transverse arches which are used here are of only slight use in bringing this thrust to fixed points; that is, to the piers between windows.

Saint-Genou, a little village between Loches and Chateauroux, has a church of the same epoch which has vaulted aisles and a closed triforium gallery with sculptured capi-

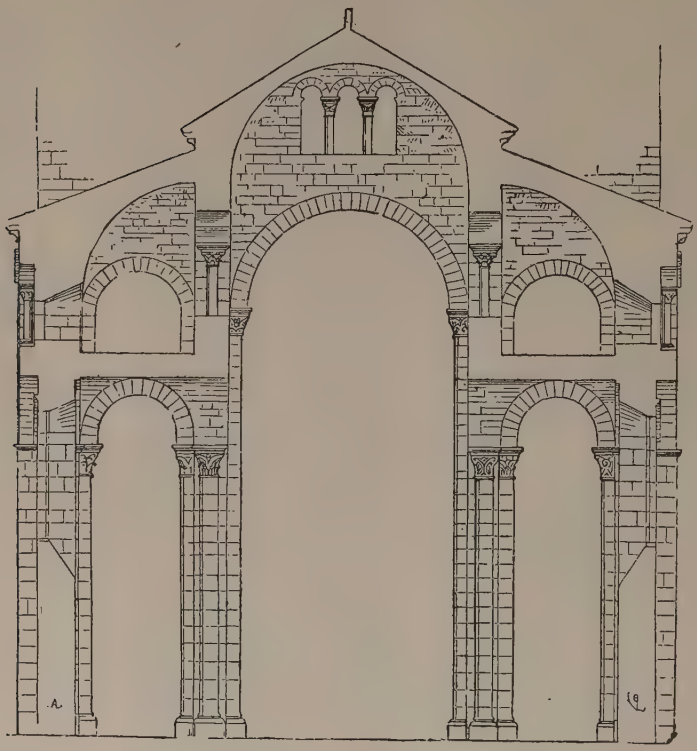


FIG. 74 (see FIG. 76).

tals of great interest. The church of Germigny-les-Prés (Loiret) was such a basilica-like church of the ninth century, and, although destroyed by restoring architects, has left behind it an accurate record.

The same epoch has left for us some very curious re-

mains of building in parti-coloured materials, such as the so-called Roman tower at Cologne, the abbey-church of Lorsche near Darmstadt, and S. Lubin at Suevres, near Blois. This decoration in large mosaic of wall-material did not lose its charm for the Romanesque builders, and disappears only with the establishment of the organized Gothic style. The exterior of the curious baptistery (Fig. 75) at Poitiers shows another attempt at ornamentation without architectural system, by building in fragments of detail, perhaps taken from other buildings. It reveals a nearly complete absence of any notion of exterior designing; and curiously enough the interior wall of the north transept was not dissimilar. In other parts of Europe few early churches remain in such condition that their general design can be made out. There seem to be none in England. The sculpture of

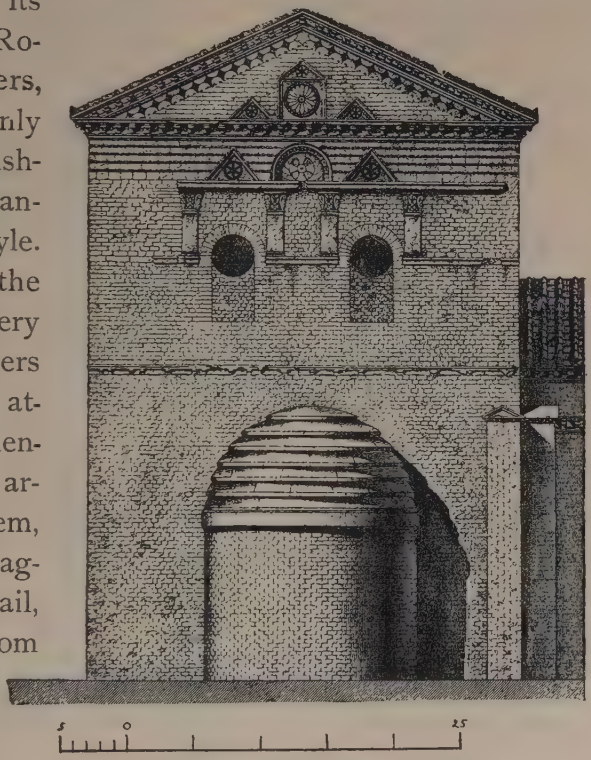


FIG. 75. Poitiers, France: Baptistery. Eleventh century.

the whole epoch was exceedingly rude, and found perhaps its lowest degeneracy in the seventh century. The interlacings, plaits, and twists of the goldsmith's work and the manuscript illumination of the time were copied in stone carving, as a few existing remains prove.

II

The year 1050 may be taken roughly as the beginning of an era of higher development in Romanesque architecture. Buildings and parts of buildings which are known to be of the half-century following 1050 show a much more complete and a more organized style than what had gone before. Thus in the church of Notre Dame du Port at Clermont-Ferrand, though there is no doubt that the plan was of an earlier date, the greater part of the exterior is of the eleventh century, and the belfry-tower and the apse with its radiating chapels are certainly of the time we are considering. These parts of the building though restored are still to be taken as of the original design; there is no reason to doubt the fidelity of the restorer's work. The plan (Fig. 76) shows how chapels, probably of the eleventh century,

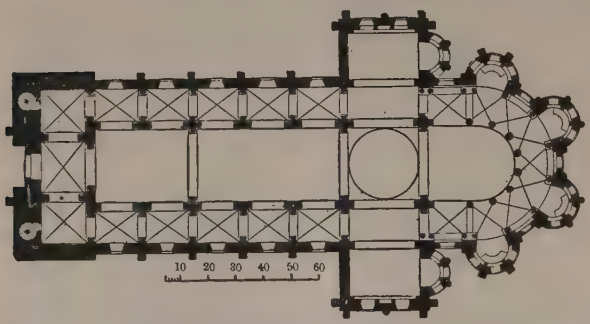


FIG. 76. Clermont-Ferrand, France: Church of Notre Dame du Port. Eleventh century.

FIG. 77 (see FIG. 76).

were built around an apse of the tenth century or of an earlier time. The exterior decoration of these chapels and of the clear-story wall of the apse, and also the vaulting of these chapels and that of the semicircular aisle into which they open, are all of an advanced Romanesque style, although the vaulting of the high nave and its aisles is certainly of an earlier date. Figure 77 shows the system of vaulting adopted. It will be seen that it is but a slight modification in principle of the Roman groined vaulting (see Figs. 29, 30, and 67). Figure 78 is a plan of a part of the aisle running around this apse. If this is compared with Fig. 77, it will be seen that the barrel-vault which roofs this rounding aisle is penetrated at each bay by two barrel-vaults, one above the window and about as wide as the main vault, the other between the columns on the church side and very much narrower. In order to bring the tops or crowns of these arches to a level, the narrow inside arches are stilted, or raised on high vertical imposts (see Fig. 77, on the left). The exterior shows a great advance in orderliness and in maturity of design. The builders have a definite and a very clear sense of the architectural effect of windows, buttresses, cornices, etc., and the curious mosaic of sandstone of different colours has evidently been adopted with deliberate purpose as an important feature in external decoration.

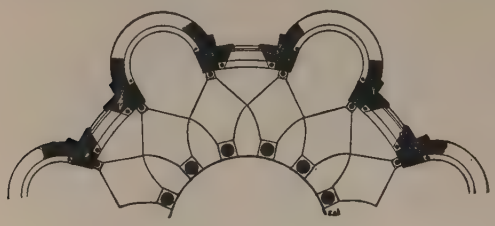


FIG. 78 (see FIG. 76).

The church of S. Front at Périgueux offers us a completely different scheme. Whereas the church at Clermont-Ferrand is of the basilica type, that of Périgueux is of the Byzantine type; in plan a Greek cross with naves about thirty-five feet in the clear, as shown in Fig. 79, and roofed by a series of cupolas. Figure 80 gives a diagram

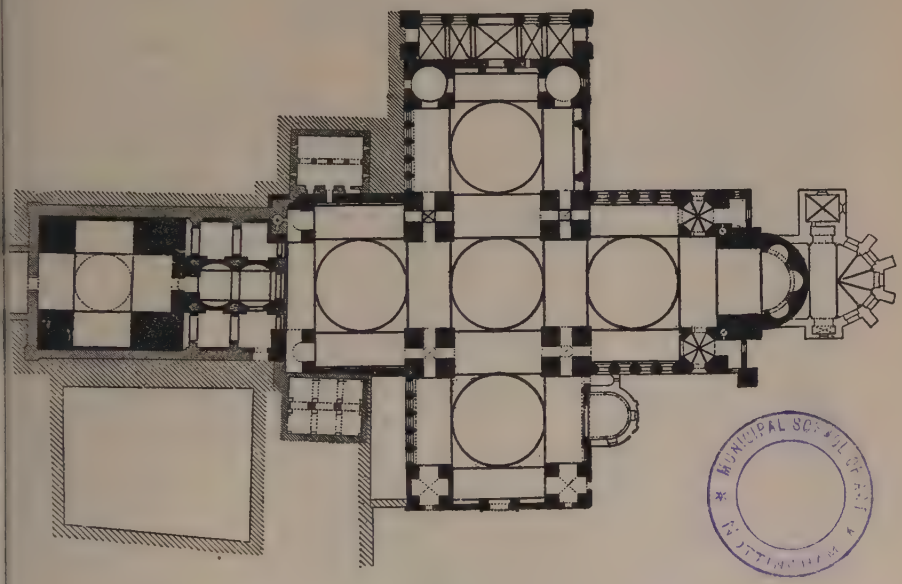


FIG. 79. Périgueux, France: Church of S. Front. Twelfth century.

of the interior as preserved for us in a drawing made by Viollet-le-Duc before the unfortunate restorations of 1865–1875.

In these two buildings at Clermont and at Périgueux the struggle between two great styles is plainly visible. The southern and eastern influence, strongly felt in some parts of northern and western Europe, made for cupola

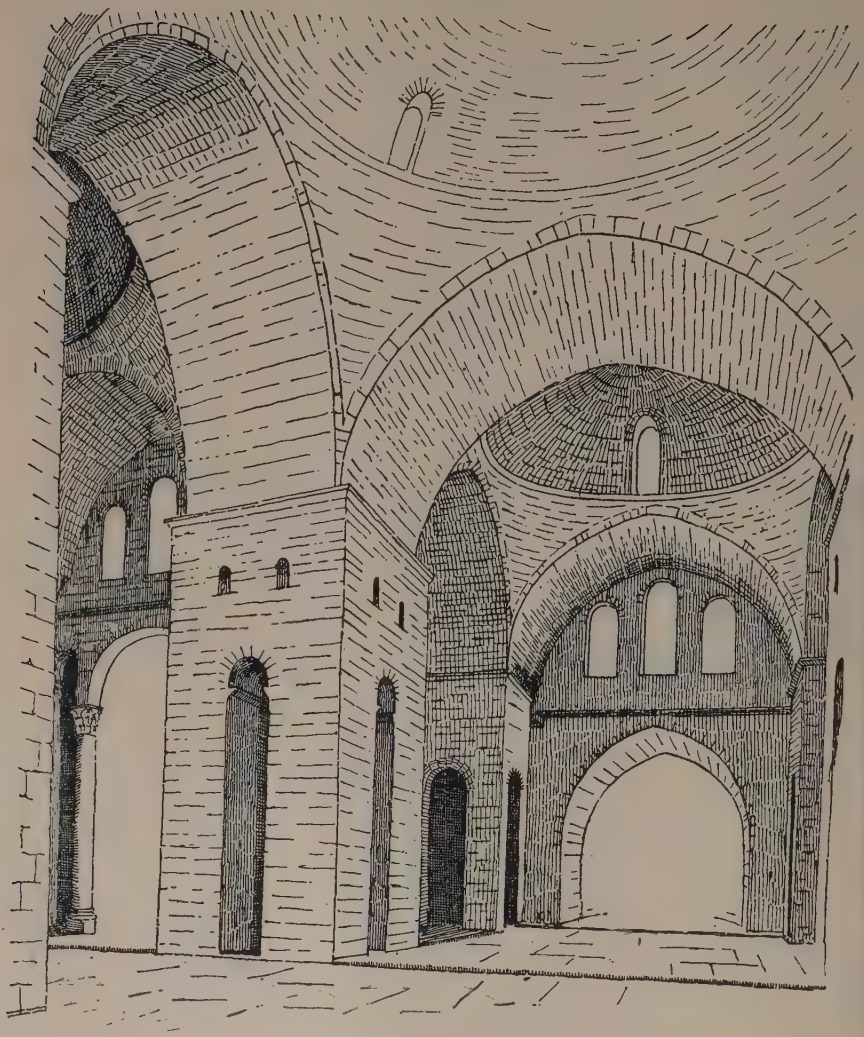


FIG. 80 (see FIG. 79).

vaulting and plans of no great extension, — square, or cruciform with short arms. So far as the four arms approach equality among themselves, the plan approaches the Greek

cross, as in S. Front and its prototype, S. Mark of Venice. What may be called the Latin influence — that is, the power of the example of Rome itself and its neighbourhood — made for the basilica form of church; and the basilica plan called for vaulting with barrel-vaults or groined vaults. With the cupola system of vaulting any surface could be easily roofed. A chapel of irregular shape as well as a perfectly square apartment could receive a cupola (see *A* and *B*, Fig. 81), where it will be seen that the pendentives, though irregular in plan, will be no more difficult to construct in *A* than in *B*. In spite of this the tendency was strongly toward the basilica plan and the groined vaulting. The cupola system and the Byzantine style of church prevailed but in few regions of the north of Europe. In the neighbourhood of Périgueux and through a considerable part of western France, the system of cupolas on pendentives prevailed. The churches of S. Étienne (S. Stephen) at Périgueux with a forty-six-foot nave, S. Étienne at Cahors with a fifty-foot nave, the cathedral church of Angoulême and the churches of

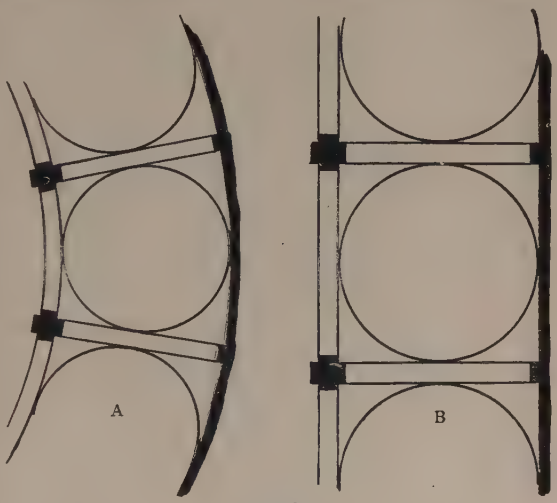


Fig. 81.

Saint Avit-Sénieur and Saint Jean de Cole, in the region which now makes the departments of the Dordogne and the Lot, are all domed structures, built in evident imitation of S. Front at Périgueux. Elsewhere in the north the basilica plan prevailed, and it is necessary to describe the system of groin-vaulting as it took shape in the eleventh century, because it is upon this that the new style of church building mainly depends, while to church building all other decorative construction was subordinate,—a mere humble copying of a few of its details.

The Roman groined vault gave the mediæval builders infinite annoyance because of its powerful thrust and because it would seem that they could not make up their minds to build buttresses of great projection. The building of a buttress two or three feet thick and extending six or seven feet out at right angles with the wall was expensive, very troublesome as to its angles and its necessary bonding with the wall, and as to the necessary protection at the top against rain. In times of rapid and dextrous building it is hard to understand the fumbling and awkward way in which such work would be undertaken in a thinly settled and impoverished country, devoid of workmen of experience and training. The vault itself, consisting of small stones held together by weak mortar, and made as thin as the builder dared put it up, in order to save transportation of material, was a very different thing from the Roman groined vault; less steady, much less resistant, but in a sense more elastic. To strengthen it and to help the masons in putting up their centring, it became customary to build a broad and deep arch across

the aisle or nave, and to build upon and above this the groined vault, not otherwise changed in form from its Roman prototype. The vaults of the aisles at Vézelay (Fig. 82) are a good instance of this construction. It is to be observed that when such transverse arches were used to span the aisles it was comparatively easy to build upon them stout cross-walls serving as buttresses for the high roof of the nave when that was vaulted. The Roman custom had been to make such groined vaults exactly square in plan, and this was the most natural and easiest form to build. When, however, a broad nave was placed between two narrow aisles, and separated from them by pillars, which fixed the width of the main divisions or bays, it is clear that the compartments of the nave would not be square if those of the aisles were so, and the reverse (see Figs. 83 and 84). The difficult question

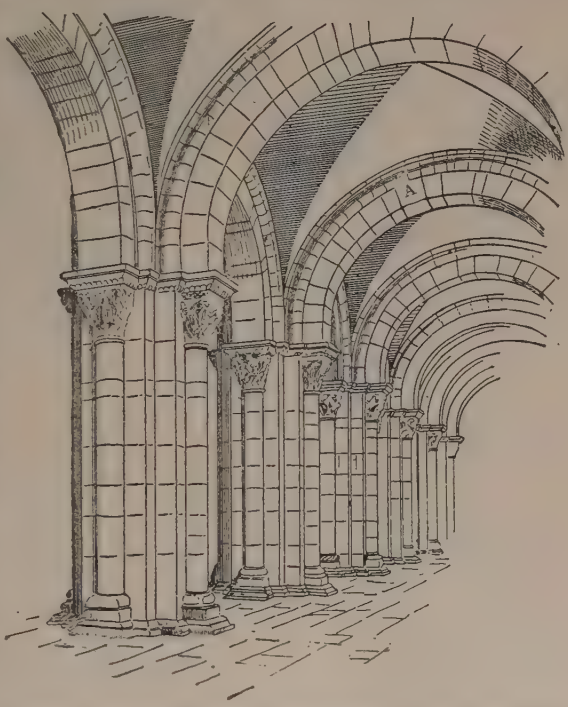


FIG. 82. Vézelay, France: Abbey church. Built in twelfth century. *A*, the transverse arch.

then arose how to vault the oblong compartments. The Romans, as we have seen, avoided the difficulty; nowhere in their work could the eleventh century builders find an example to guide them. It seems never to have occurred

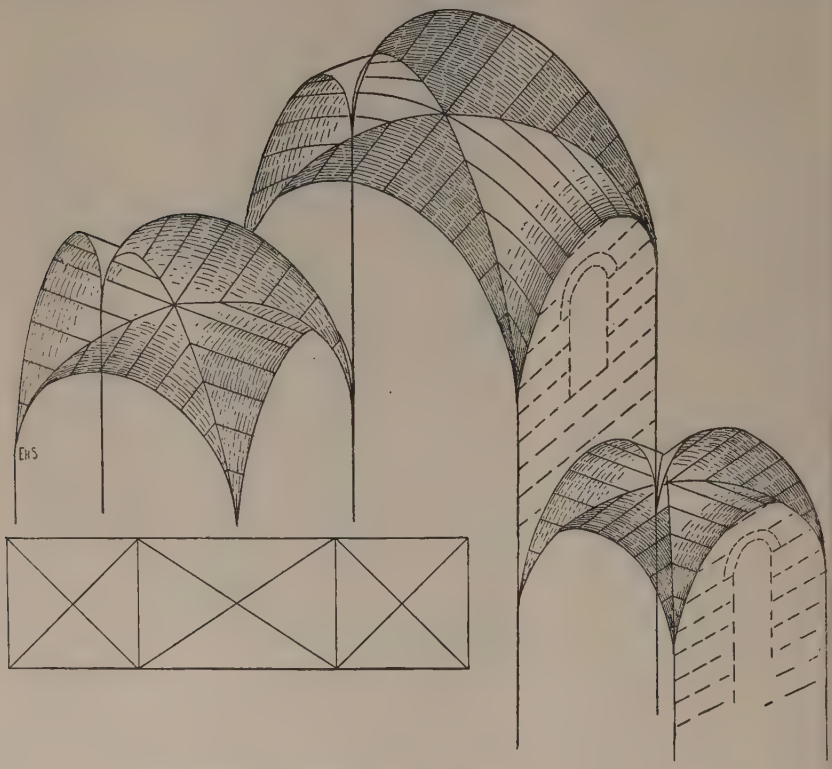


FIG. 83. Diagram of vaulting where the aisles are divided into squares.

to the Romans, nor to their imitators in the eleventh century, to use the form of vault which became so common in the sixteenth century (see Fig. 85, and compare Figs. 215 and 234). This form, however, is that which results naturally from allowing a small cylinder to meet and inter-

sect with a larger one. Instead of this plan, which seems to modern builders the obvious one, the eleventh-century workmen adopted modifications of the one shown in Figs. 83 and 84. In Fig. 83 it is assumed that the aisles are

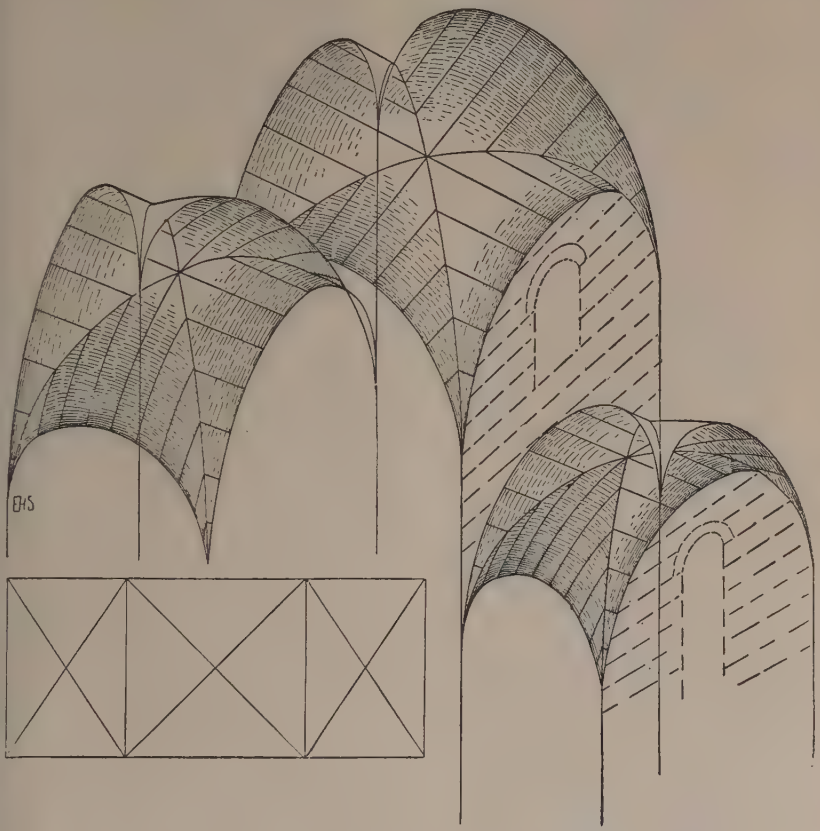


FIG. 84. Diagram of vaulting where the nave is divided into squares.

divided into squares, and the nave consequently into parallelograms as wide as the squares of the aisle. The figure gives an outline plan of one bay and a perspective view

of the three vaults seen from below. It will be seen that the two vaults of the aisles are made up of cylindrical surfaces; that is to say, these vaults, like the Roman vaults shown in Figs. 29 and 67, are made up of two cylinders of equal size which intersect one another. The strong lines drawn on the surface of these vaults are, it will be seen, straight lines, and these show that the surfaces are those of cylinders. On the other hand, the vault over the parallelogram of the nave is made up of a cylinder meeting another curved surface which is not a cylinder, as is shown by the strong lines here, which are not straight, but curved. The system adopted is farther shown in Fig. 86, where, although the arch on AB is a large half-circle, as is shown in the broken curve, and the arch on AC a small half-circle, yet the intersections of the two vaulted surfaces, that is to say the groins, are made to meet one another at the centre O. The Romanesque builders seem to have been resolute to keep the plan of each parallelogram of vaulting like that shown in Fig. 86, with the diagonal lines AD and CB representing the intersections or groins. Now this could only be obtained by giving to the surface of the vault above the triangle

FIG. 85.

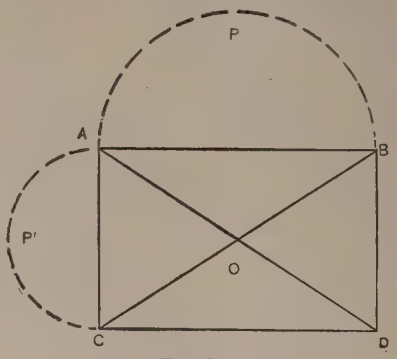


FIG. 86.

AOC a shape which the English writers speak of as annular, calling such a vault an annular vault, although it is not strictly part of a mathematical annular surface. The French writers call it, with greater approach to accuracy, *voute ellipsoïdale;* but it is really a curved surface which is not described by any geometrical term. Sometimes the smaller round arch at AC is raised above the impost, as indicated by the broken lines in Fig. 87, where $A'C'$ is the springing line of the round arch, and the lines AA' and CC' denote the distance which this arch is raised above the impost. An arch treated in this way is said to be stilted. If the small arch is raised so high that its crown P' comes on the same level with the crown of the larger arch P, the resulting surface of the triangular vault AOC is extremely complicated and ugly; if, on the other hand, the smaller round arch is not stilted at all, the clear-story window under it will be low and small and the vault insufficiently lighted. The plan usually followed was to stilt the smaller round arch somewhat, but not nearly so much as to bring P' on a level with P. Figure 88 shows the resulting vault where M and N are the transverse arches, AC the springing line of the smaller arch as in Figs. 86 and 87, P the crown of that smaller arch, and X the vault over the triangle AOC in Figs. 86 and 87.

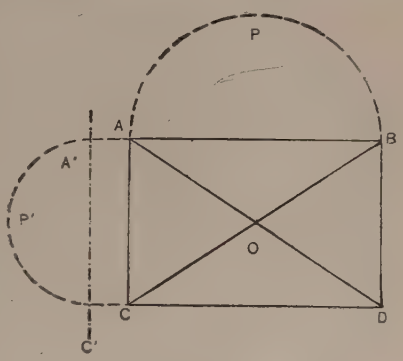


Fig. 87.

Another system was resorted to in order to avoid the difficulty of vaulting a long and narrow parallelogram. This system is the one adopted in many German and many Italian churches. The vaults are all square in plan, or nearly so; the width of the nave being assumed about double that of the aisles. Figure 89 shows this plan, which is nearly that of the vaulting of the cathedrals of Worms in Hesse Darmstadt and Spires or Speyer in Bavaria. Stout transverse arches separate all the squares, and stiffen if they do not exactly support them. In such plans as these every alternate pillar is pressed sidewise by the aisle arches, which act upon one side only, and therefore is in danger of being forced out of the vertical and made to lean toward the nave. This difficulty was not so great, however, as to prevent the common use of the plan in question. In the church of S. Ambrogio, at Milan, the same general plan is followed, and the aisles are vaulted as at Spires, but a great change occurs in the vaulting of the large

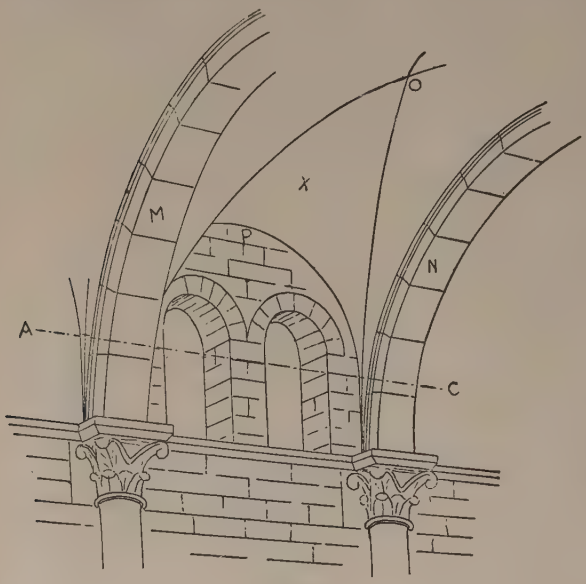


FIG. 88.

squares into which the nave is divided. Large transverse arches cross the nave, and other arches, also of large section and strongly built, are carried diagonally from pillar to pillar, as shown in Fig. 90. These diagonal arches are carried up much higher than the transverse arches; in fact, they are exactly or nearly semicircular, and therefore their crowns rise higher than the crowns of the smaller semicircular arches which cross the nave at right angles. The vault built above these heavy separate arches is a continuous cupola of a shape which cannot be accurately described, having no true mathematical form. It does not rest upon the arches beneath, which seem to have been put in merely to assist in building the wooden centring upon which the cupola was formed. Another building with the same general arrangement of plan is S. Michele at Pavia, of which Fig. 91 shows the elevation toward the nave of one great bay including two bays of the aisle.

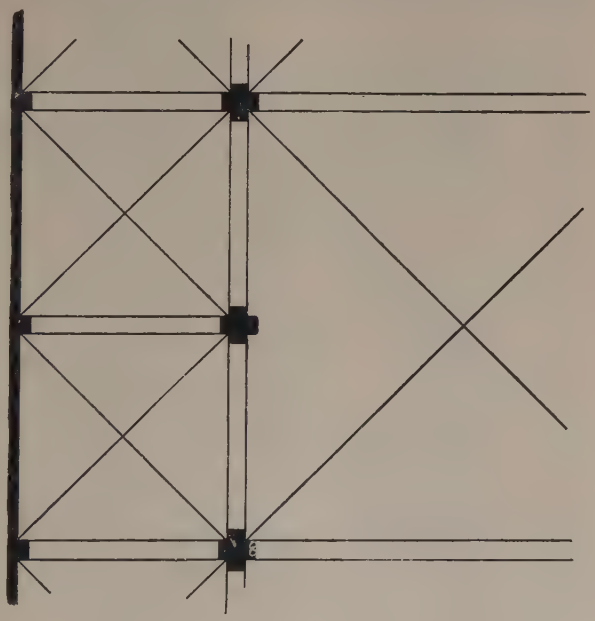


FIG. 89.

This elevation may be used with the section (Fig. 90) to explain the construction of these two churches, as they are very similar in every respect. S. Michele, like S. Ambrogio, is noticeable for the great difference in size of the piers, those which carry the nave roof, as well as their share of the aisle roof, and those which carry the aisle roof alone; although in this respect S. Ambrogio goes a little further into extremes than S. Michele. Any one bay of either of these churches is a beautiful composition; the massiveness of the great piers leads naturally and agreeably to the ponder-

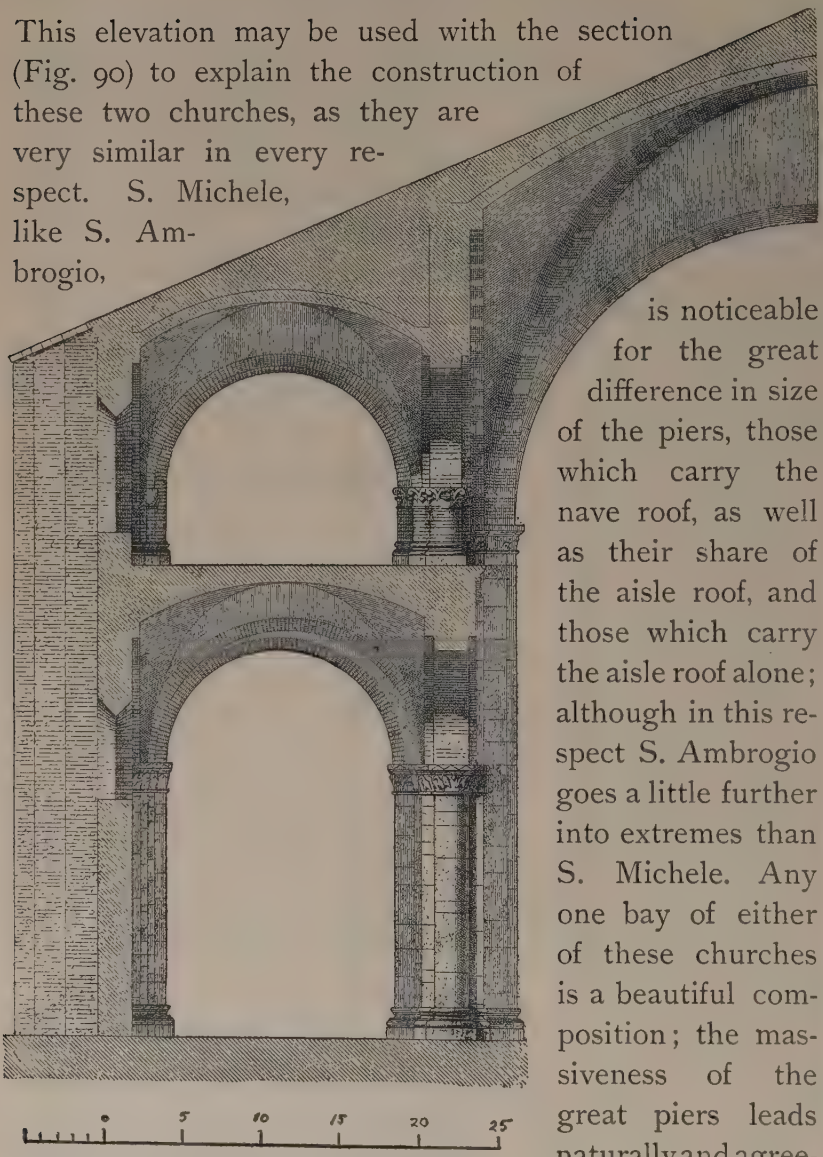


FIG. 90. Milan, Italy: Church of S. Ambrogio, rebuilt in the twelfth century. Part of cross section, with nave and aisles.

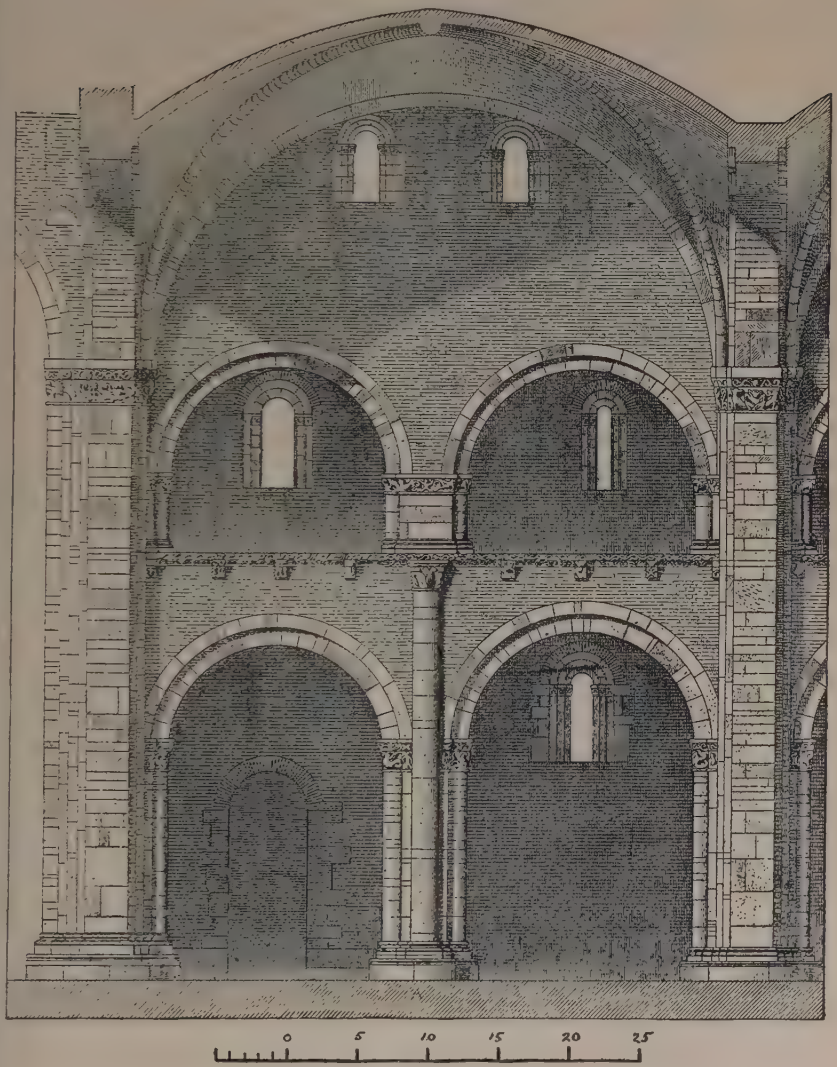


FIG. 91. Pavia, Italy: S. Michele, one bay of nave. Eleventh and twelfth centuries.

ous vault above, and the lighter piers between them cause only a pleasant surprise that they should be found

sufficient for their own task. Any one bay, whether looked at on one side only as a single flat composition or as the means of covering the whole width of the church for the length of about fifty feet, is a fine architectural conception; but it failed to win approval in the regions which we now call France, and which, from the twelfth to the fifteenth century inclusive, embraced those countries of Europe where architectural art was the most living and the most progressive. One reason for this is that the great bays, forty-six or forty-eight feet from centre to centre, reduced the apparent length of the church by their smaller number and their greater size. Thus at S. Michele there are only two great bays in the length of the church, and at S. Ambrogio, which, however, passes for a good-sized and well-proportioned basilica, there are but four. Another and probably more weighty reason is the bad logic which the builders must have observed in such a plan; for why should each alternate pillar differ so widely from its neighbours? Why should not each pillar of the row dividing the nave from an aisle be like every other? If these pillars were made exactly alike in themselves, and in the work they have to do, the result would be an arrangement by which the nave would be divided into as many separate compartments of vaulting as either aisle; one to one in the whole length of the church. This is the plan which was destined to prevail in Burgundy, in Champagne, in Picardy, and throughout almost the whole region which we now call France. The great churches of western Germany, such as the cathedrals of Spires, Worms, Mayence, and Bamberg, were all arranged on the plan of S. Michele

and S. Ambrogio; but the German builders tried to overcome the serious objections to this plan; namely, that it diminishes the apparent length of the nave, by making each bay proportionally very narrow and very high. Thus in Mayence Cathedral each bay of the nave is in width, measured along the nave, as compared with the width across the nave, only as seven to ten, whereas in S. Michele of Pavia the relative dimensions are nearly the reverse of this. In other words, one of the nave vaultings is a parallelogram of seven by ten or nearly so, in either church, but in the Italian example the greater length is along the nave, while in the German example it is across the nave. So, as regards the height: in either of the Italian churches named, the total height to the crown of the vault is less than once and a half of the width of a great bay, but at Mayence the total height is more than two and a half

Fig. 92. Spires, Prussia: Cathedral. Interior. Eleventh and twelfth centuries.

times that width. Figure 91 may be compared with Fig. 92 for the importance of this modification. It must also be observed that the German churches are generally so much longer than the Italian ones, that they have not so much to fear the shortening effect of too few and too large parts. In Mayence Cathedral the otherwise too short nave is immensely lengthened in effect by the square of the tower and the two apses which prolong it; in Worms there are five great bays, and here again the tower and the apses play their part; in Spires there are six great bays: in fact, all the German round-arched cathedrals had great length of nave given them as one of their elements of architectural effect.

The abbey church at Vézelay in Burgundy is as good an example as exists of the fully developed Romanesque interior, according to the system described above (p. 170), in which one compartment of the nave corresponds to one of each aisle. Figure 82 gives a view of one of the aisles; in Fig. 93 is given the great nave, seen from the choir. It will be seen that the principal vaults are built on the same general plan as those of the aisles; but it will be seen also that the vaults of the nave have sunk. The transverse arches have been put out of shape to such an extent that they are no longer even approximately semicircular, but approach visibly the form called basket-handled, or three-centred. In other words, the walls and piers were forced apart by the thrust of these very arches, yielding under the weight of the vaults and of their own materials, and as they spread, the crowns of the arches came down, until the whole fabric was endangered. Flying buttresses

were built, and these restored the equilibrium and saved the church, but these were an afterthought. Their style is much later than that of the interior.

It is to be noted that the action of the thrust of arches upon the walls of a building is very gradual. For some

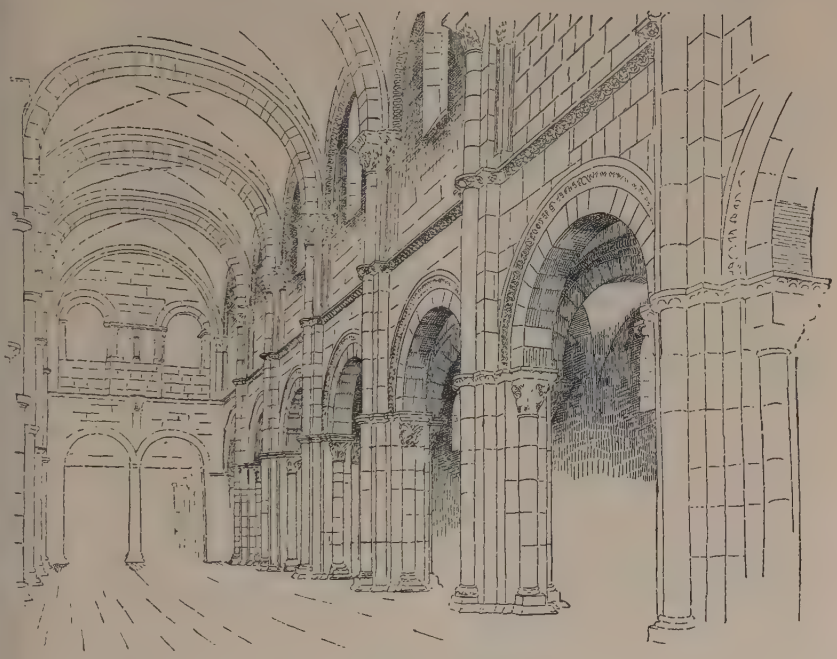


FIG. 93. Vézelay (see FIG. 82).

months or years all may seem to be safe and in good order, and when the effects of the thrust become visible, it will generally be too late to save the perfect shape and symmetry of the building, although it may be kept from falling. Accordingly there are very many buildings of the eleventh and twelfth centuries which show the action

of the nave-vaults in an outward slope of their upper walls or piers; the mischief having been stopped by flying buttresses built up, or by iron tie-rods put in, in time to save the building from entire collapse.

Many buildings were erected or completed during this period of developed Romanesque in which different styles of vaulting were tried. Thus the church called La Martorana at Palermo was probably not completed until about 1140, a time when the beginnings of Gothic architecture were showing themselves in the north, as we shall see in the next chapter; and yet this church is vaulted in an archaic fashion, reminding one of the primitive church of Trèves in Germany and of other buildings of early Christian times. It is a good system of vaulting, easy to build, permanent, capable of charming decoration by means of painting or mosaic, but involving a peculiar plan, divided into squares and rectangles, each of which is filled with its own vault, which may be of almost any system, and involving also a host of columns or pillars at the angles of the squares and rectangles. This plan has its prototype in the great cisterns of Constantinople (see p. 142), and is frequently put to use in later styles, incapable as it seems of a considerable development. No great style of architecture could grow out of it so long as the buildings most in demand were Christian churches, because for these a large and unincumbered interior was necessary, and that style was sure to win, other things being equal, which offered that advantage.

III

The plan of the cathedral of Peterborough in England shows how a Romanesque church of large size was conceived (Fig. 94). Such a church would have its aisles vaulted as indicated on the plan as soon as the bishop of the diocese could command a very small spare annual sum and the services of a tolerable master-mason. The clear-story of the choir and that of the nave would not be vaulted until the resources of the diocese were considerably greater. In the meantime a wooden ceiling would be built above the clear-story, either flat and with bright-coloured painting for its only decoration, or carried along the lines of the rafters and collar beam in such a way as to seem crowned up in the middle, and to leave exposed a small part of the roof timbers. Such a roof, however, was frequently burned, or in other ways injured, and accordingly renewed in a new style. Figure 95 shows the choir of Peterborough Cathedral, which dates from about 1125, together with a part of the south transept, and the choir

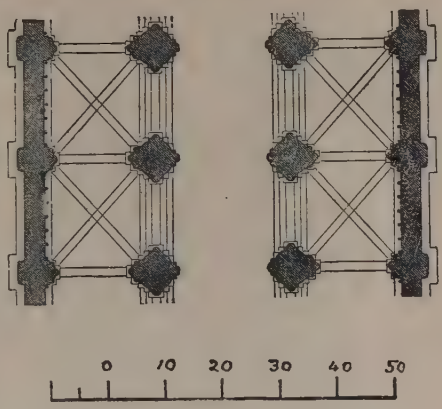


Fig. 94. Peterborough, England: Cathedral. Plan of part of nave, close of twelfth century. The aisles are vaulted; the nave has a wooden ceiling.

aisle and the gallery on the southern side. The ceiling is only indicated in our illustration, as the style of the present one is of wood and of a much later date.

Mention has been made above (see p. 149) of the two

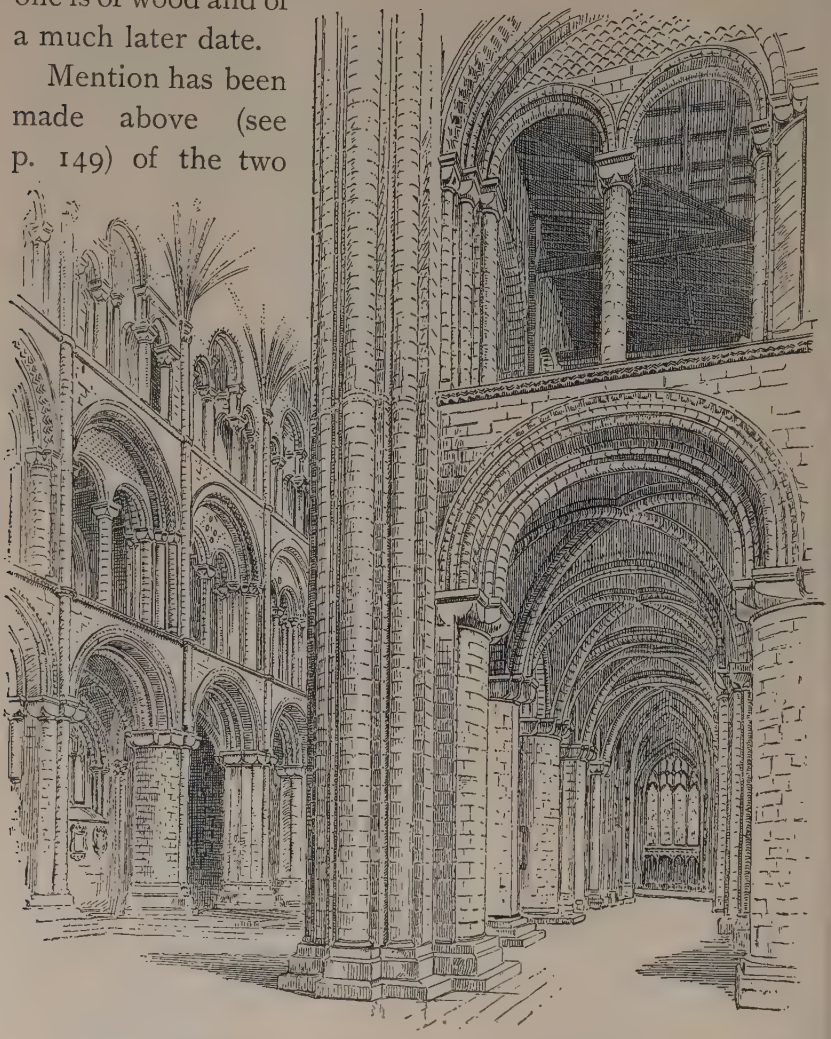


FIG. 95. Peterborough, England: Cathedral, choir and south aisle of choir, seen from south transept.

typical plans which developed themselves from the original basilica plan. It was stated that the Romanesque plan proper had at the east end three apses, turned to the east, north, and south, as shown in Fig. 71. The plan of the cathedral of Tournai in Belgium is an excellent instance of this typical Romanesque plan. The great square is con-

Fig. 96. Tournai, Belgium: Cathedral, towers of tenth and eleventh centuries.

tinued upward in a tower, as explained above (p. 149), and this tower, though low, is roofed by a lofty octagonal spire. Four slender square towers roofed in like manner with square wooden spires are set, two on the northern, two on the southern, side, so that the whole central group of five, rising high above the nave and above the houses of the town, is extraordinarily effective and is unsurpassed by the

central mass of any cathedral in Europe (see Fig. 96). An extremely effective interior was also obtained; the visitor entering by the doors of the west end sees before him the long uniform series of the arcades of the nave lighted only by small windows, and beyond this the sudden expansion both upward and horizontally of the square and the three apses filled with light from numerous and high windows which are not obstructed by any interior architectural dispositions. When the high altar is placed in the middle of this great square, as is now done in the cathedral of Florence, the most perfect combination of the moral and architectural centre points of the church is obtained.

The architectural details of the developed Romanesque style are of great interest and deserve analytical observation and criticism. They are generally extremely simple and obvious, the doorways being the most natural openings in a thick wall, with very little added ornamentation in the way of gables and the like, such as we shall find so common in Gothic architecture. Plate I. gives the principal front of the cathedral of Angoulême, in which elaborate carved ornament is seen combined with a plain structure. Figure 97 shows the interior of the galilee of Durham Cathedral in the north of England. The zigzag ornamentation of the arches is peculiar to the Romanesque architecture of northwestern Europe. The capitals of the clustered pillars are not as rich as many to be found in England and on the continent. The attractiveness of this building is in the lightness of the structure, very unusual for the time. Figure 98 gives a portion of the cloister of

PLATE I. WEST FRONT OF THE CATHEDRAL OF ANGOULÊME (CHARENTE) FRANCE

First half of XII Century; Restored 1870-75

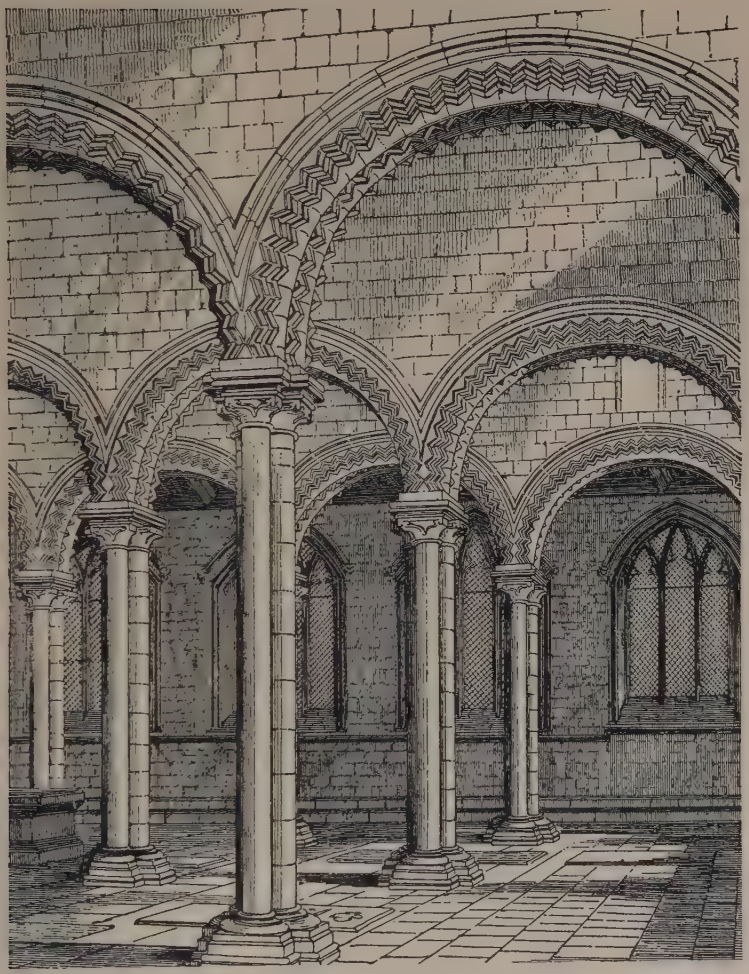


FIG. 97. Durham, England: Galilee of Cathedral. Close of the twelfth century.

S. Trophime at Arles in southern France, interesting for the free use of figure sculpture combined with leafage.

Windows, so rich in later styles, are small and rather plain; it is but seldom that windows are very noticeable in

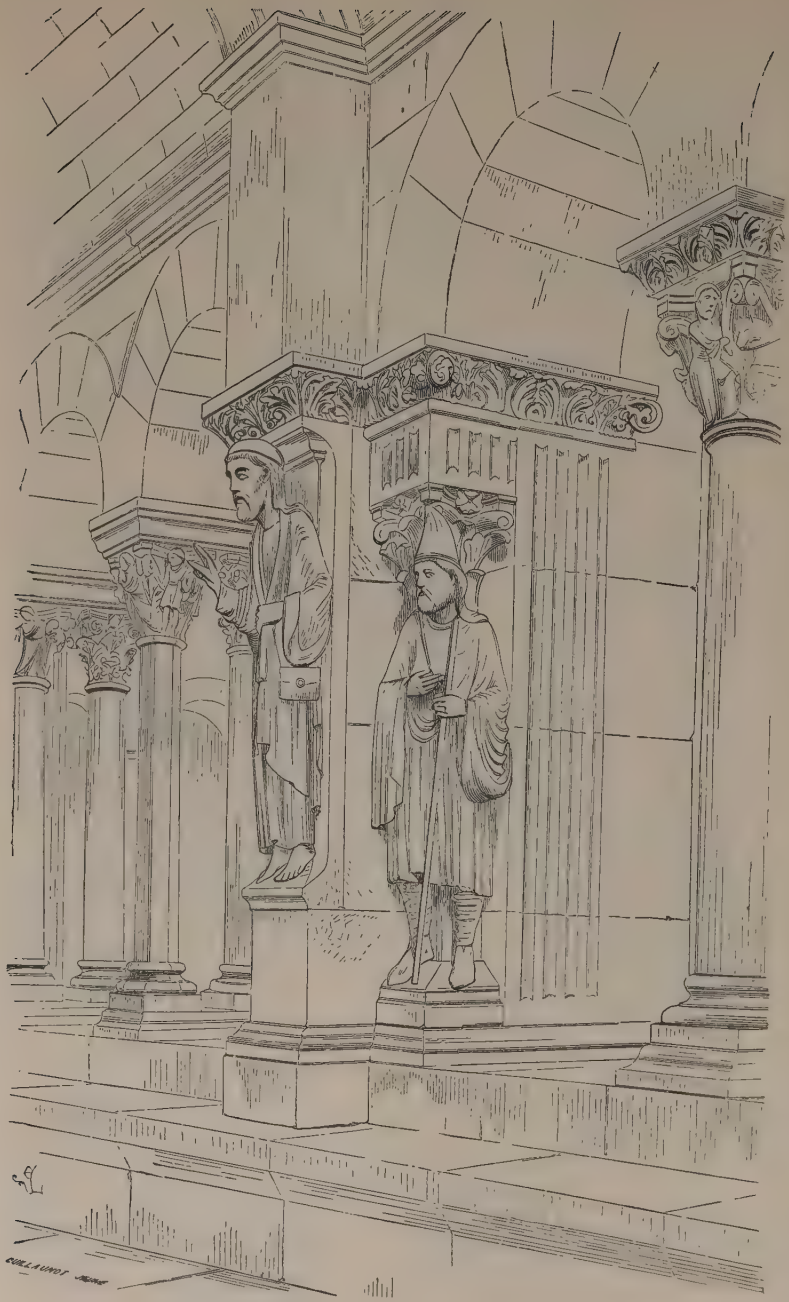


FIG. 98. Arles, France: S. Trophime. Cloister. Twelfth century.

Romanesque. Towers are of great interest throughout the century 1050–1150, and are particularly splendid toward the close of this epoch. That of the church at Vendôme on the railroad between Paris and Tours, finished about 1140 (Fig. 99), is an instance of the highest possible beauty. It stands free of the church, which has been rebuilt in the Flamboyant style of the fifteenth century. Although the arches are bluntly pointed, the tower is purely Romanesque in conception and construction. It is well, at the close of this chapter, to see an instance of the pointed arch showing itself timidly in Romanesque work before it had been adopted as a constructional feature. In another tower, later but not much later, the round arch is preserved throughout, while the lightness of construction and the great skill displayed are already of the Gothic style. This is the central tower of the little church of Vernouillet twenty-two miles northwest of Paris, shown in a very accurate drawing (Fig. 100).

IV

The architecture of the Byzantine Empire continued much more nearly on the lines of its own past than any Western architecture could do. Though with greatly diminished territory and resources, the Empire still held up the standard of classical civilization until the ruinous and fatal capture of Constantinople by the crusaders in 1203. The church of S. Irene was built in the ninth century, and is a building admirable in plan and general interior effect, and different from any Western church, having a nave roofed by two large cupolas, one of which,

MUNIT. SCHOOL OF ART NOTTINGHAM

the easterly one, rises higher than the rest, as if to mark the neighbourhood of the altar and sanctuary. A vaulted aisle surrounds this on three sides, and above the vaulting of the aisles is a great gallery roofed only by the high vaults which flank the cupolas. The church of H. Sophia at Salonika has three apses at the east end and one cupola. The church of S. Mark at Venice is as purely Byzantine as any more Eastern church so far as its actual construction is concerned. At the time of the restorations of 1881–1883, it became possible to judge of what the church was originally, that is to say, before it was sheathed with marble, and it was found to resemble in exterior design, as it was known to resemble in construction, the tenth century churches of Constantinople and Salonika. The church of Hagia Theotokos at Constantinople was built in the tenth century, and

FIG. 99. Vendôme, France: Tower of the Church. 1130–1150.

here a more elaborate exterior design in coloured materials was used, but all these churches resemble one another strongly. Figure 101 gives a plan of the Theotokos church, and Fig. 102 a view of its principal front. The church is not large; indeed it is unusually narrow, and being fronted with a splendid narthex, five cupolas in length, and projecting beyond the flanks of the church, is perhaps unique in the T-shaped plan which results from this.

In Athens and other places in Greece, in Trebizond, and in the different towns of the Turkish Empire from Servia to Jerusalem, small Byzantine churches continue in use to this day, and these have been rebuilt at different times during the last nine hundred years without its

FIG. 100. Vernouillet, France: Belfry of Church. About 1190.

being possible in the present state of our knowledge to classify their slightly changing styles with any accuracy. Byzantine architecture, containing within itself the possibilities of exterior effect as well as its well-known interior

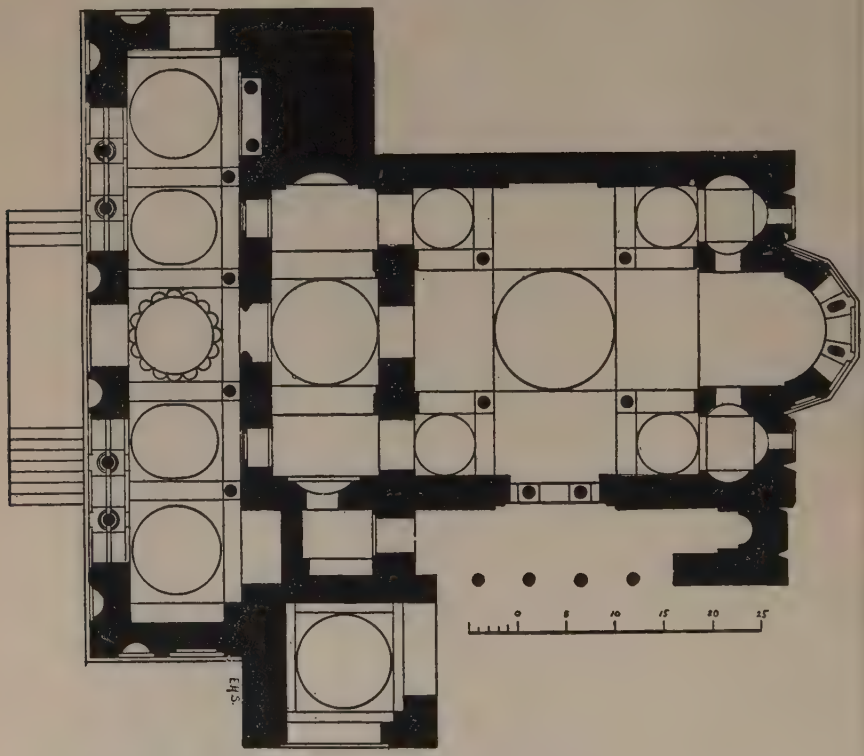


FIG. 101. Constantinople, Turkey: Church of the Theotokos. Beginning of tenth century.

splendour, has been signally unfortunate in the political and social condition of the lands in which it is at home. Under different but equally unfavourable conditions its part in the architecture of the Mohammedan nations was

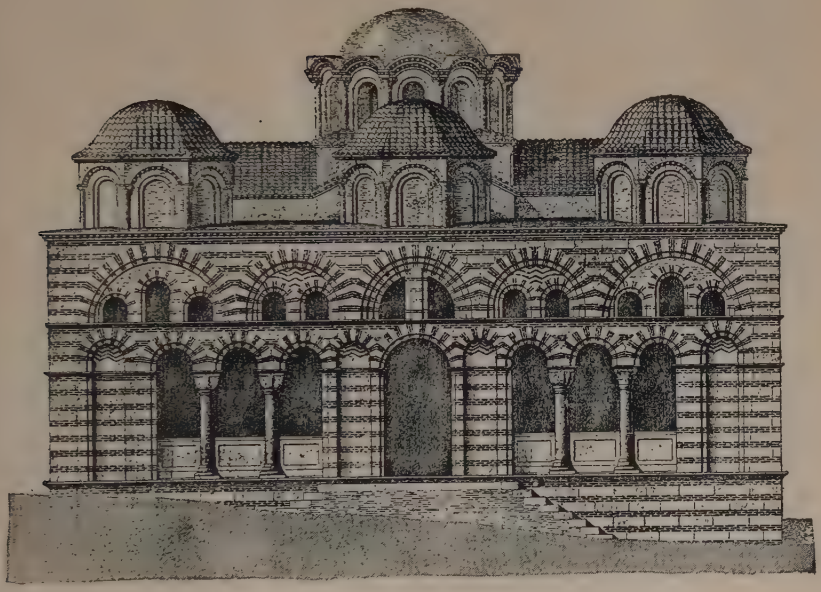


FIG. 102. Constantinople (see FIG. 101).

played; and apart from this its only development on a large scale has been in Russia, where whim and paradox rather than good taste seem to have directed it. Native Russian decorative art is not without its merits as a semi-Oriental style, centuries old; and its rough building of timber is as well worthy of study as Swiss or Tyrolese wooden construction; but the church architecture developed from the later Byzantine cupola churches is apparently not worthy to rank with the church building of western Europe.

CHAPTER V

THE ARCHITECTURE OF WESTERN EUROPE, 1150 TO 1300 A.D. GOTHIC ARCHITECTURE IS DEVELOPED FROM ROMANESQUE IN FRANCE. SPAIN AND BELGIUM AND WESTERN GERMANY ADOPT IT QUICKLY. ENGLAND MODIFIES THE ROMANESQUE BY GOTHIC FEATURES QUICKLY, AND EASTERN GERMANY DOES THE SAME MORE SLOWLY. IN ITALY THE STYLE IS INTRODUCED COMPLETE, APPARENTLY FROM EASTERN FRANCE, BUT IT IS NOT UNDERSTOOD NOR ADOPTED AS A NATIONAL STYLE.

I

AT the middle of the twelfth century, as we have seen in Chapter IV., the church buildings of northern and western Europe had assumed a character far more solid and enduring, and an appearance far more artistical, than those of the eight previous centuries. Moreover, the constant efforts of the builders toward a complete system of vaulting for their church roofs had so far succeeded that two systems had reached a certain excellence: first, the cupola supported on pendentives, as at S. Front of Périgueux; second, the groined vault copied from the Roman as to its form, but very much lighter in build and altogether much less solid and permanent, but also more elastic, and exerting a continual outward pressure upon the walls or piers. About the middle of this century a new

feature appears. It will be remembered that the light and weak groined vault required a heavy transverse arch thrown across the nave or the aisle between every two squares of vaulting (see pp. 160, 161). Furthermore, a glance at the groined vault, as shown in Figs. 29, 30, 67, 82, and 93, will show that the masonry at the groin, that is at the angle of intersection between the two cylinders which meet and intersect one another, would naturally be made more perfect and exact than that of the other parts of the vault. This groin or angle of intersection begins commonly at its impost as a sharp right angle; and as the vault rises toward the crown, this angle becomes more and more obtuse, and finally no angle at all, lost in the cupola-like curved surface of the crown of the vault. Nothing could be more natural than to cut the stones which form this groin, and even to put them in place, in part at least, without waiting for the smaller and less careful masonry of the shell between them. Besides the groins, there are the edges of the vault coming next the wall, which might also be treated with a special care, and the transverse arch across the nave or aisle. In the diagram Fig. 103, let it be assumed that one of these transverse arches is built above AB and an-

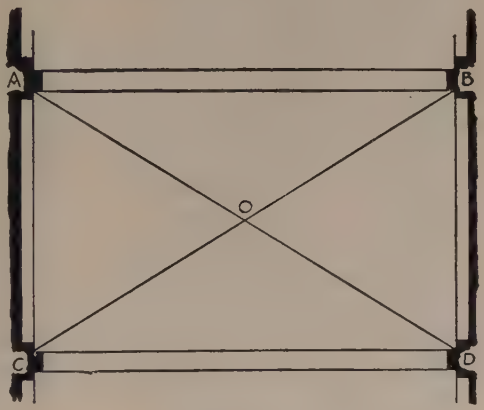


FIG. 103.

other above *CD*, and also that a wall arch is built above *AC*, and another above *BD*. What, now, could be more natural than to build also stout arches above the two diagonals? Having to cut and fit carefully the stone for the four arches *AB* and *CD*, *AC* and *BD*, the builder would be in the way of cutting stones for the groins, which then form the diagonal arches *AD* and *BC*.

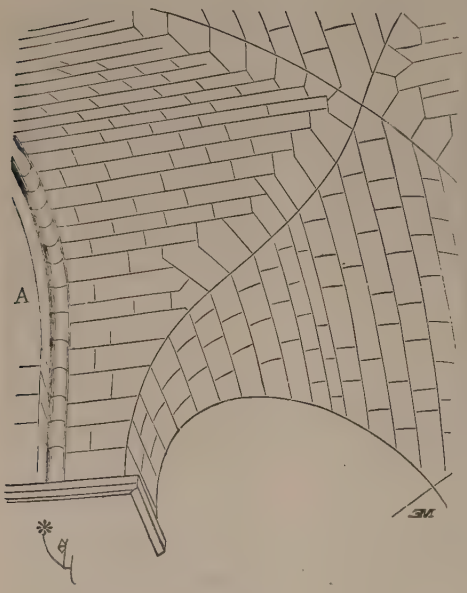


FIG. 104.

This he would find especially desirable as a method of proceeding in the case of a vault on a curved plan, as where the aisle turns around an apse. Figure 104 shows such a vault; and the stones which form the groin are seen to be larger than the others and carefully cut. Moreover, and this is a very important point, it is very easy to erect a wooden centring upon which to lay the stones of an arch one foot or twenty inches wide, whereas the centring for a groined vault or a considerable part of it is difficult to construct, and requires a great deal of excellent wood and a great deal of skill to support it from below in the perfect and unbroken curvature necessary to guide the masons and support the masonry aright. Suppose, then,

that all these arches, those which divide the square of vaulting diagonally as well as those which enclose it, are all built. There will result a vault of which the plan will be as in Fig. 105, and it is evident that there will be four open triangles, *AOB* etc. (Fig. 105), each of which is of moderate extent. Obviously, it is not so hard to put up a centring for one of these triangles, now that there are solid stone arches on every side of it. Moreover, the lower part of each triangle, where the shell of the vault is almost like a wall, requires no centre, as will be seen below. The wooden centring may even be secured to the stone arches when built and made safe without any supports from below. The surface of the vault filling the triangular space *AOB* or *BOD*, or the like, may indeed be very much distorted in appearance; it is very difficult to represent it by a drawing (see Fig. 106), and very difficult to form a clear conception of it without a model; but to the builders it was one of the

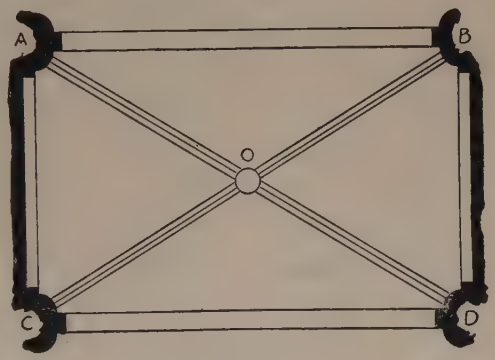


FIG. 105.

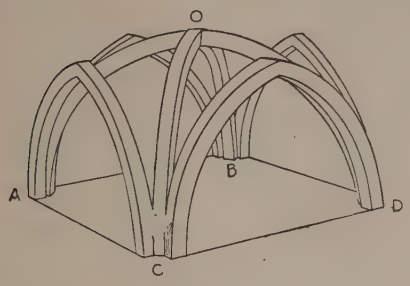


FIG. 106.

simplest of problems. Look again at Fig. 103, the plan of the vaulting square; if the arch *AD* is a semicircle and the arch *AB* also a semicircle, it is evident that the crown of *AD* at *O* will rise high above the crown of *AB*. Therefore the four triangles were of course seen by the masons, as they stood looking at the completed skeleton of six arches (see Fig. 106), as rising toward their common centre *O* in a sort of cupola. That was the general form which their completed vault was to take; and this fact was easy for them to see; but they had also to lay the stones in each of the four triangles, *AOB* etc., so that each triangle would be a little vault by itself. In Figs. 105 and 106 *CA* is a wall arch, *CD* a transverse arch, *CO* half of one of the diagonal arches. Now, each one of these triangles, *AOC* etc., is to be filled with mason-work of small stones. Where this mason-work begins, at the bottom, just above the capital of the pillar or shaft which supports it, it will be carried up almost vertical; a wall which can scarcely be seen to curve inward. It needs no centring for the first ten or twelve courses of stone; merely a piece of board with one edge cut to the right curve to guide the masons. The centring will be needed when the triangle opens wider and the courses of stone grow longer, while at the same time the stones are supported less and less by the courses already laid, and hang more and more over empty space. It is evident that each one of these courses of small stones must itself be arched up, otherwise, when the centring was removed, it would fall. Every separate course is one member of a vault; every two or three adjacent courses form by themselves a vault capable of

supporting itself, bearing at each end upon the stone arches previously built (see Fig. 107, in which is seen the diagonal arch, with parts of the masonry of two adjoining triangles). This is the system of vaulting adopted about the middle of the twelfth century and already erected in a few of the churches which we still call Romanesque. It is characteristic of Gothic vaulting of all epochs and in all countries, except at the time of gradual abandonment,

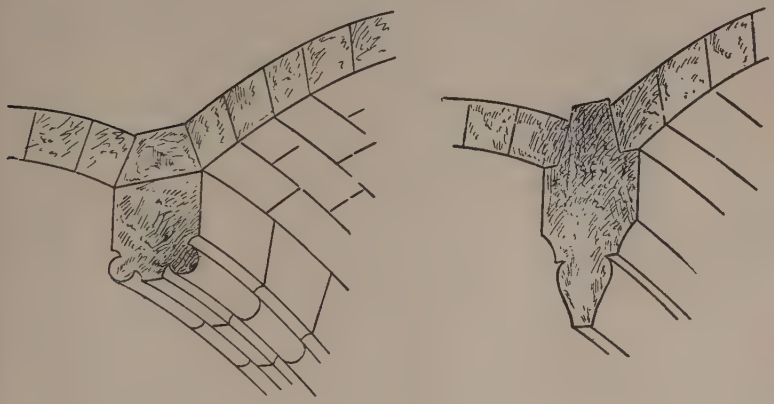


Fig. 107.

The shell is sometimes built upon the back of the rib and sometimes upon skewbacks especially cut to receive it (see Fig. 107).

The fact that the crown of the two diagonal arches was so very high above the crowns of the wall arches and the transverse arches must have troubled the builders greatly; not because producing complicated or difficult construction, but because taking up so much room, and causing the timber framing of the outer roof to be set so high,

with walls necessarily carried up to support it. We have seen in the last chapter how they sometimes raised the crown of one of the smaller arches by stilting the whole arch. This was so unsatisfactory, however, that the builders of the small kingdom of France, the "Royal Domain" of Paris, and its neighbouring provinces, began about 1150 to use the pointed arch.[1] This was a form of arch which the crusaders had seen in the East, which had been introduced into the vaulting of S. Front of Périgueux, as early as the middle of the eleventh century, and which the builders themselves must have been familiar with as an ornamental feature used indifferently with round arches in small arcades, and the like (see the tower of Vendôme, Fig. 99). With the pointed arch used for the wall arches, *AC*, *BD*, Fig. 106, and for the transverse arches *AB*, *CD*, it was possible to bring the crowns of all six arches to a level. The builders were not always desirous to

[1] The question, what building or buildings first show the true Gothic vaulting, cannot be considered here, as it would take many pages to treat it properly. The reader is referred to Viollet-le-Duc, "Dictionnaire Raisonné de l'Architecture Française," s.v. *Architecture*, *Construction*, *Voûte*, *Porche*, *Chapelle*; to the reviews and criticisms on this work by Anthyme Saint-Paul, and to a paper, by that author in the *Bulletin Monumental*, 1875; to Louis Gonse, "L'Art Gothique" (Paris, 1894); to the works of Eugène Lefèvre-Pontalis; and to C. H. Moore, "Gothic Architecture." The "Handbuch der Architektur," published at Darmstadt, may be expected to treat this and similar questions thoroughly in the volume, not yet published, on mediæval church architecture. Adamy, "Architektonik," and Schnaase, "Geschichte der Bildenden Künste," treat the origin of Gothic architecture more briefly. The most elaborate treatise on northern Romanesque styles, without a knowledge of which the Gothic style cannot be rightly understood, is M. Ruprich-Robert's "L'Architecture Normande." Of small and popular books, M. Corroyer's two volumes, "L'Architecture Romane" and "L'Architecture Gothique," and M. Lechevallier-Chevignard's "Les Styles Français" may be read.

have the crowns come exactly to a level; they preferred a slightly concave shape to their vault, and Fig. 106 shows a more common form than one which would bring the crowns of the four arches *AB*, *AC*, etc., as high as the meeting of the diagonal ribs. Figure 108 shows still a third form according to which the triangles of the vaulting were subdivided by ribs connecting the crowns of the different large arches. Viollet-le-Duc has pointed out that this last system was occasioned not so much by a desire to decrease the size of the triangles, as by a fixed habit of laying the courses of stone in the filling of the vault, as in Fig. 109, so that the extra rib at the top of the vault was necessary to receive the interlacing ends of these courses of stone. He points out that this system of laying the courses is evidently a reminiscence of cupola construction. The other system, that in which

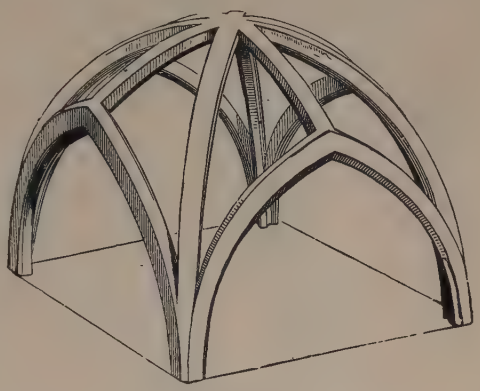


FIG. 108.

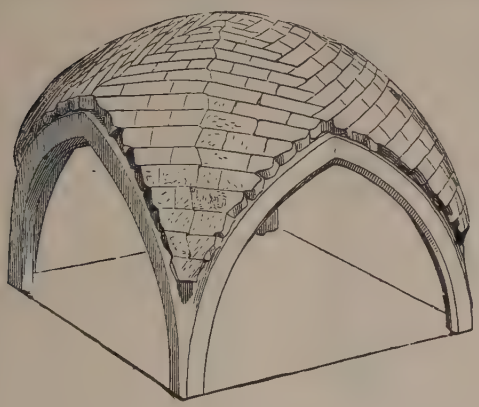


FIG. 109.

the courses of stone are laid as in Fig. 107, above, and as shown in Fig. 110, takes its origin, as he points out, from reminiscences of Roman groined vaulting. This latter is assuredly the system most characteristic of Gothic building proper; but both are used, and in the work of later times the builders of very complicated vaults employed the two systems indiscriminately.

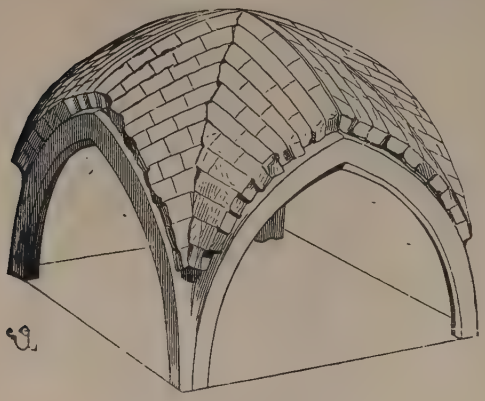


FIG. 110.

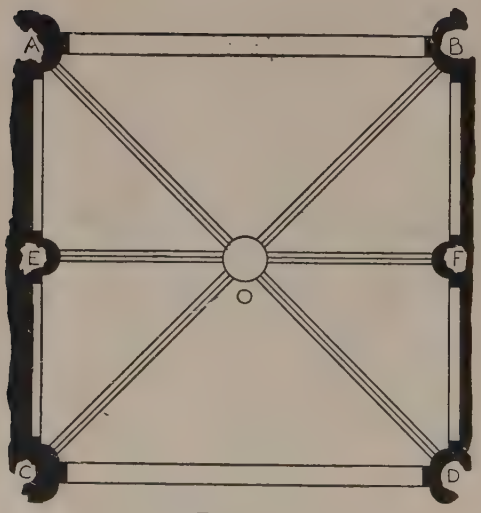


FIG. 111.

Another plan of vaulting is that called by English writers the sexpartite vault. This may indeed have been the earliest of all forms of Gothic vaulting proper; for it was approached in the days of Romanesque experiments in vaulting. When, as in Fig. 83, the aisles had been vaulted in squares, and the builders were puzzled how to vault the corresponding

parallelograms of the nave, nearly twice as long in the width of the nave as in the distance lengthwise from pillar to pillar, one plan which suggested itself was this of the sexpartite vault. On *AD* and *BC* (Fig. 111) are the diagonal arches, each supposed to be a semicircle, as in the cases above cited. On *AB* and *CD* are pointed transverse arches, their crowns reaching nearly, but not quite, to the height of

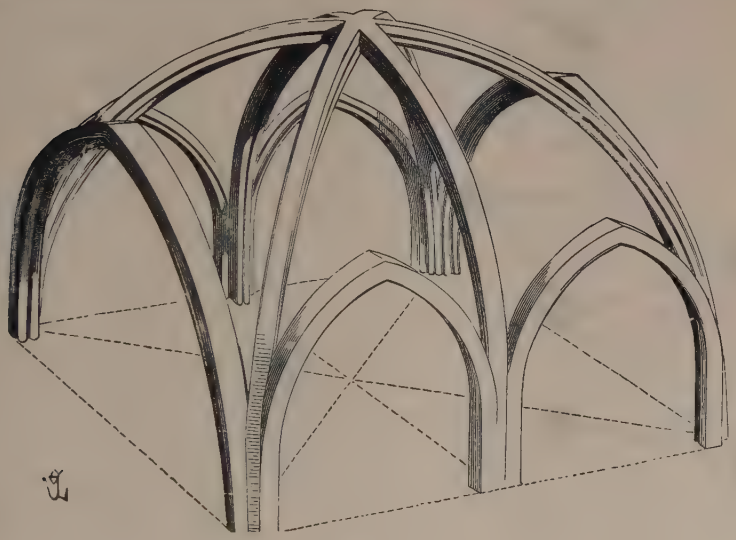


Fig. 112.

the meeting-place, *O*, of the diagonals. Finally, on *EF* another transverse arch is built, more sharply pointed than *AB* and *CD*, and meeting the diagonal arches in *O*. Figure 112 shows this arrangement of the arches of construction, or ribs. There are four smaller and two larger triangles to be filled with vaulting. The small triangles seem of a very fantastic form, warped and distorted, but they were not hard to vault in actual practice.

There is still another way in which the use of the pointed arch was found to be the only solution of a difficulty. We have seen in the two previous chapters that the Romanesque builders were fond of putting an aisle outside of and surrounding a semicircular apse. Let Fig. 113 be the plan of part of such an aisle; *B* and *D* are columns separating this aisle from the apse, *A* and *C* are half-columns, engaged columns, or corbels built into the outer wall of the aisle. Now if *BC* and *AD* are diagonal arches, the place where they meet and cross one another is no longer the crown of either, supposing them to be semicircular arches as before, but a point far below the crown. A very awkward looking vault results from this. It is perhaps easier and certainly better to keep the point of meeting at the crown, that is to say, to keep the point of meeting higher than any other part of the skeleton of ribs, but this could only be brought about by entirely giving up the semicircular arches. In Fig. 113 the adjoining bay or unit of vaulting (now no longer a square) is supposed to be vaulted by means of the pointed arches erected over *AB*, *C'D'*, *AC'*, and *BD'*, and the four half-arches *AO'*, *BO'*, *C'O'*, *D'O'*. This use of half-arches is, of course,

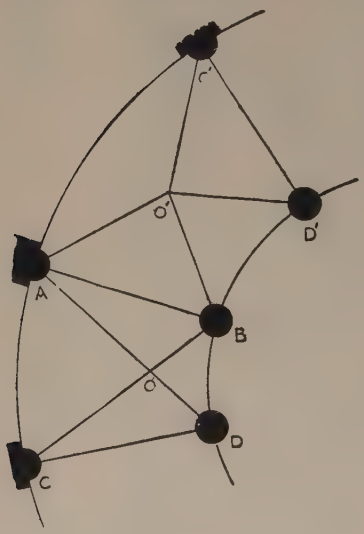


FIG. 113.

only practicable where the pointed arch is fully recognized as the chief member of the construction. The pointed arch consists of two curved ribs or rafters meeting at a point; let now the builders grow accustomed to the thought of the pointed arch as not one single member but a combination of two members, and it is easy to take the next step and use the half-arches freely. Not two half-arches only, but three on occasion, or any odd number, as well as a series of pairs, may meet at a common point, and, this principle once established, the building of a vault over any horizontal surface, no matter how irregular in shape, becomes easy.[1]

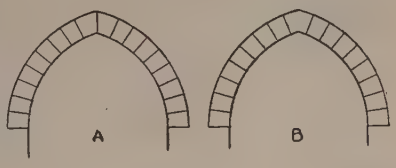


Fig. 114.

This, then, is Gothic vaulting, as originating in the Royal Domain of France,—taken up at once in the provinces dependent on the French crown, such as Burgundy, Normandy, and French Flanders, and adopted almost as promptly in the countries south of the Loire and north of the Somme. The distinctions between the practice of one province and another are too minute and too uncertain as to their geographical limitations to be insisted on, here. This Gothic vaulting is made up of three essential parts: first, the skeleton or cage of strong arches described above, which arches we call generally ribs; second, the shell made

[1] The pointed arch considered as made up of two half-arches will, of course, have no keystone: it will be built as at *A*, not as at *B* (Fig. 114). This is a feature of pure Gothic building, and the appearance of a keystone means misunderstanding of the style.

of smaller stones cut like voussoirs, every stone doing its part in an arch-construction, the shell of each compartment having convexity enough and radiation of joints sufficient to enable it to carry its own weight and that of the filling behind; and third, the filling, rough stone-and-mortar masonry, put in anyhow to prevent the arched ribs from rising at the haunches and so throwing out the whole system of vaulting. Such a vault exerts a very powerful pressure at four points: *A*, *B*, *C*, *D*, in Figs. 103, 111, and 113, above. In the case of a church having a nave but no aisles, like the Sainte Chapelle of Paris, there is no difficulty: buttresses were built as shown in Fig. 115 at *A*, *C*, *B*, *D*, etc., as deep and as heavy as necessary. If, however, the church had aisles, while the vaulting of these aisles was easy to keep in its place by means of ordinary buttresses, how should the vaulting of the nave be held up? In Fig. 116 the great vault of the nave will exercise a powerful thrust at *A*, and, in fact, would not stand a month. It is true that a very deep buttress-wall might be built, but this would load the arch *MN* across the aisle, in such a way as to increase the thrust of the aisle vault inward, as at *B*, so much as to endanger the safety of the high, slender pier between the nave and the aisle. This pier is kept in place by the dead weight coming upon it verti-

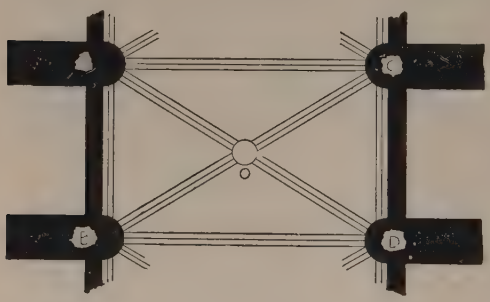


FIG. 115.

cally, the weight of the vaults and the roofing of both nave and aisle, but the effect of this weight is limited. We may do this, however; we may pierce the buttress-wall at *F*, making, if we choose, a very large opening; but then we must continue the buttress-wall farther out from the church; for, after all, we need a certain amount of mere passive resistance, of dead weight, to take up all these thrusts. Building our buttress in this way, therefore, we reach the conclusion shown in Fig. 117, in which is shown a system of two aisles on each side of the nave, and a very high and heavy buttress-wall with arch-ways pierced in it and taking up the thrust of the clear-story vault, the vault of the gallery over the inner aisle, and that of the outer aisle. With this system the vaults of aisles and nave are perfectly well stayed up, and the supports between aisles and nave are left to the single task of supporting vertical pressure, and therefore may be very slight. The half-arches shown in Fig. 117 taken with the pieces of wall upon them are called flying buttresses. In Fig. 127, and especially in Plates II. and III. the flying buttress is seen in

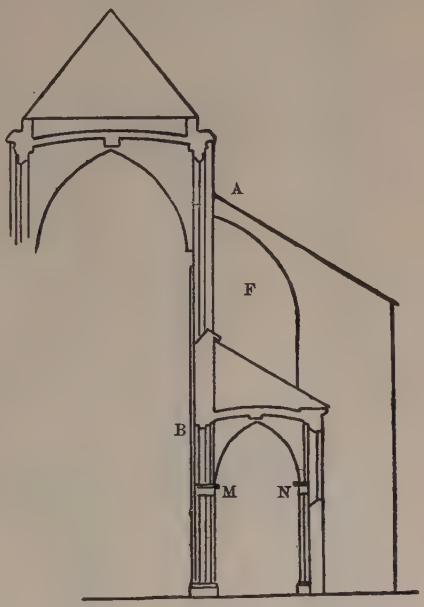


FIG. 116.

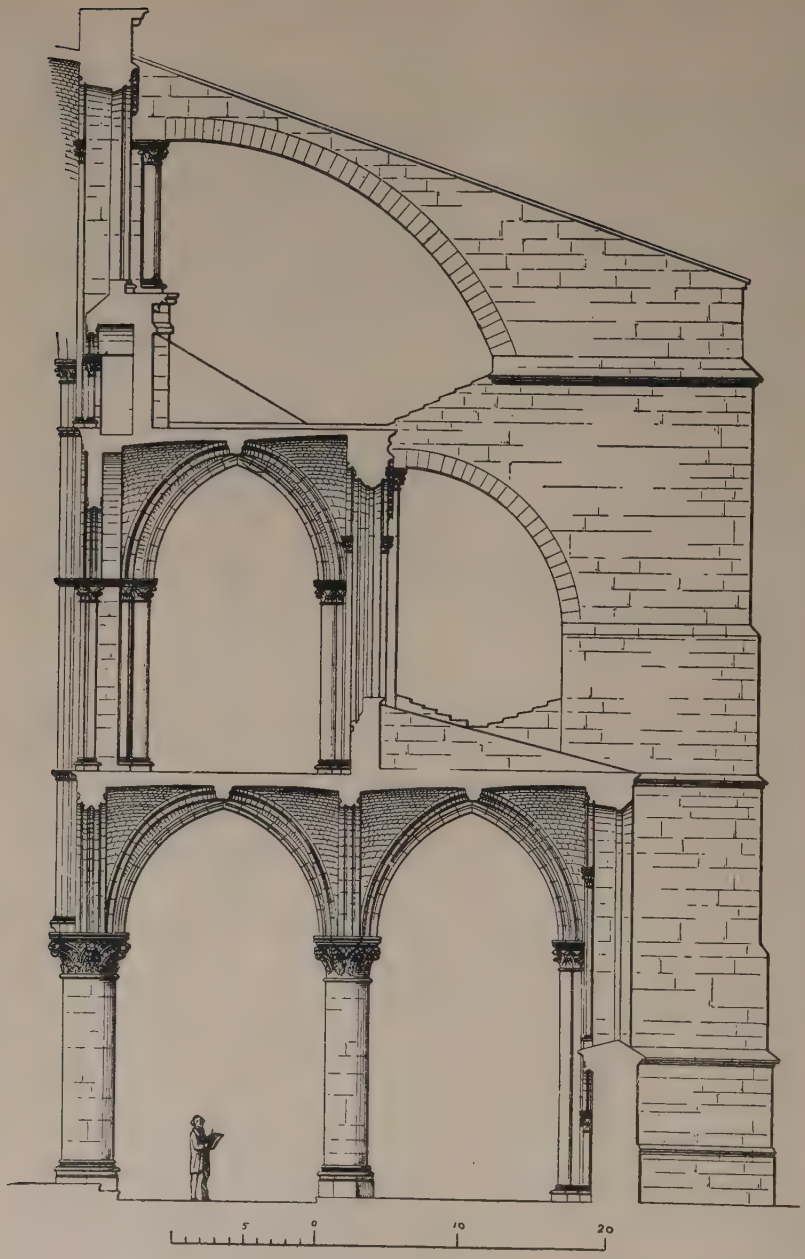


FIG. 117. Reims, France: S. Remy. Section across choir with buttress-system of twelfth century.

its more developed form. This new feature is an essential part of Gothic construction; it appears first as early as 1160, but is hardly common until a time twenty years later.

The structure then is completed by the use of flying buttresses, and the Gothic system may be described as follows: All inner roofs or ceilings to be of masonry vaulting, composed of arched ribs which are built first and which carry the weight and take the thrust of the shells of vaulting between them; these ribs meeting in groups generally of three or five upon points which are supported from below by slender pillars; all sideway thrusts taken up by the contrary action of other thrusts *plus* the necessary friction and weight of masonry, except that at the outer perimeter of the building a buttress is set up outside, to resist by its dead weight the thrust of the outermost group of ribs; where this buttress would obstruct the free space of another enclosure (as where the buttress of a nave arch would obstruct an aisle, Fig. 116) the necessary buttress moved away, and set up outside of the second enclosure, and the thrust carried across this enclosed space overhead by means of a flying buttress. An attempt has been made to express all this epigrammatically in the phrase "a roof of stone with walls of glass," and this is so far just that it is evident that there are no longer any walls in the sense of weight-carrying structures. The walls of a true Gothic building are merely screens against the weather and against intrusion. They may be, therefore, partly or wholly window sash, or they may be replaced, as in the interior of a church, between choir and

choir-aisles, by low screens of carved stone, or wrought iron gratings, or tombs, or the mere backs of stalls and altar screens.

The mere supporting of a masonry ceiling on slender and isolated uprights was not new; the immense cisterns of Constantinople, built in the early days of Byzantine architecture, were of this type of structure. Such a cistern was like such a Gothic interior as we shall have to describe in the next chapter, except in two respects: first, it had not the flexible rib-vault; second, the abutments which resist the thrust of its outermost vaults were not put outside of its enclosure with deliberate purpose, receiving architectural treatment.

One result of the Gothic structure was great lightness and slenderness of interior architecture. Figure 118 shows one bay of the rounded south transept of Soissons Cathedral. The slender vaulting shafts which rise from the floor indicate the main pillars supporting the vaulted ceiling, of which indeed the vaulting shafts form part; but these piers are only about three feet square in plan, and the other columns are slender rods. There is a sharp contrast between the architectural effect which is sought and obtained here, and that of a great Roman structure, such as is shown in Fig. 29 or 30. In the one case great massiveness, and, if interior space and height, then space and height justified, so to speak, and explained by immeasurable weight and strength of the solid parts; in the other case, interior space obtained in an unexpected and almost unexplained way, by means of solid parts which seem insufficient on an imperfect examination, and yet are seen to be doing their work.

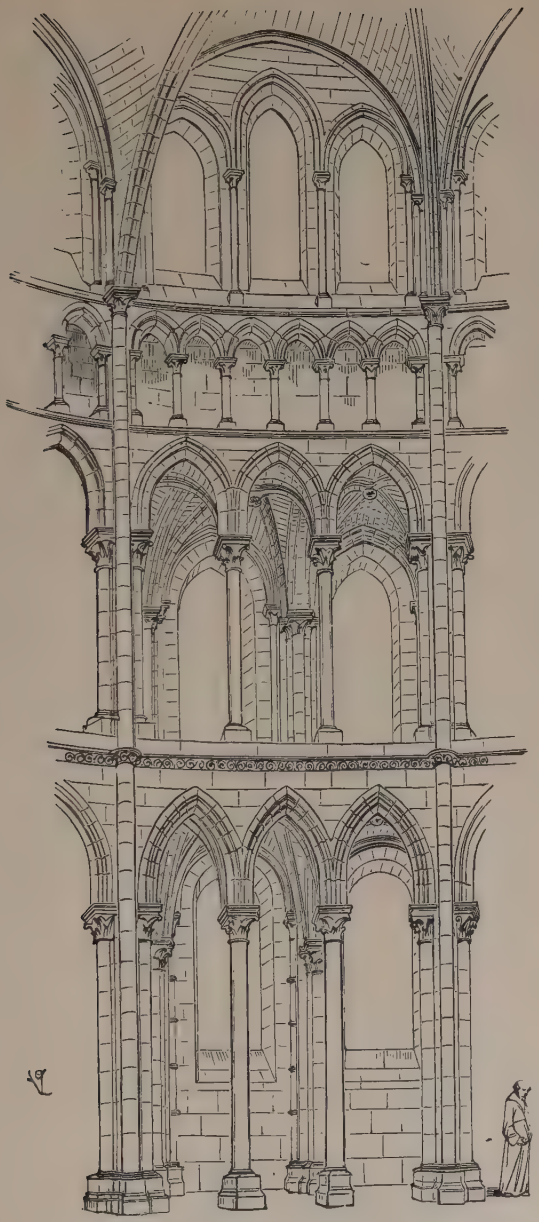


FIG. 118. Soissons, France: Cathedral. Detail of the transept, southern arm. Built about 1180 A.D.

Another result of the Gothic structure is height, great in proportion to the horizontal space. This comparative height is a necessary result of the plan and arrangement of the building, and the means adopted of lighting a large interior which is covered by a stone roof resting on slender supports. In Fig. 119 let *A* be the half-section of a small early basilica: it will be about 40 feet high to the ridge of the roof. Let *B* be the half-section of a Gothic church on the same ground plan. As glass was abundant and the decoration of it well understood, neither of which was at all the case when the basilica was built, more window surface was called for; and as the windows were at once made highly ornamental, and partly obscured as to the passage of light by the richness of the glass employed, the windows tended to grow larger still. The aisle 12 feet wide would tend to be at least 16 feet high to the springing of the vaults; for this brings the capitals of the nave columns down to a height of 13 feet above the floor, measured to their neck-mouldings: quite low enough! The result is a height to the crown of the nave vault of 61

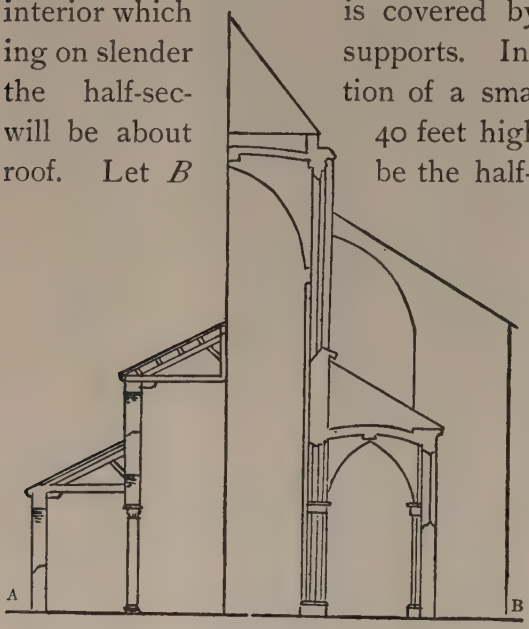


FIG. 119.

feet, and a height to the ridge of the roof of 82 feet. This, however, is with a nave only 24 feet wide: enlarge the nave to 50 feet wide, and we have a proportion, 24:50::61:127, and 24:50::82:171 feet. Now the dimensions 50 feet in width of nave, 127 feet to crown of vault, and 171 feet of total height to ridge are very nearly those of the cathedrals of the thirteenth century, and it seems unnecessary to seek for their great height in attributing to their builders a soaring or aspiring temper. They built, like other men, to produce what they needed, with some reference, as well, to the buildings of their neighbours, and with some desire to surpass them.

The new system, once well established, about 1180, must have been seen at once to be capable of a lightness and spaciousness of interior effect never before attained. To the builders of the time a church existed for its interior primarily; the doors being always open, the population — going to it several times a day for mass, for confession, to listen to sermons, stopping within it to talk, making appointments to meet in its corners, treating it as the common exchange or in-door forum and basilica in one — would be apt to look upon any newly discovered means of making this interior twice as large with the same amount of solid material as a sensible gain to the whole community. Moreover, the great churches of the bishops, one such in each diocese, the cathedrals, as we call them, were in a very special way the objects of great interest. The bishops themselves looked upon them as their own peculiar domain, a domain which was to be made more splendid and more useful than the somewhat similar

structures of the monastic orders. Each bishop disputed in a sense his own lordship over his diocese with the lord of the manor, the feudal *seigneur;* and, as the lord's castle stood at a visible height above the town, the cathedral must needs rise high within the town walls, and, while it gave what the castle could never give, a place of resort open to all the people, it must needs attain to

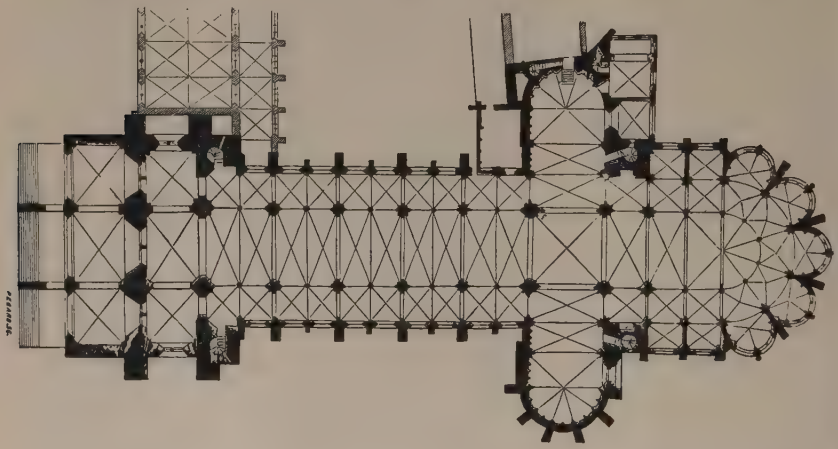


FIG. 120. Noyon, France: Cathedral. Chiefly of 1180 to 1200 A.D. Plan 84 feet to 1 inch.

an equal or superior external importance. It is to the cathedral churches, then, that we are to look for the extended and perfected Gothic structure. Figure 120 shows the plan of the cathedral of Noyon, chosen as one of the earliest of which the general disposition has remained unchanged; and also as perhaps the smallest of all the highly developed churches. It was all finished before the year 1200, except the west front and except as mentioned in the next paragraph. The choir and ring of chapels around

it are of matured Gothic style, although considered the earliest built of all parts of the church. On the other hand, the two arms of the transept are still apsidal in form, as is also the southern arm of the transept of the cathedral at Soissons in the same part of France (see Fig. 118); and this rounding of the extremity seems very early; purely Romanesque in character. In each case it was undoubtedly the foundations of a previously existing early Romanesque church which were built upon.

Figure 121 shows the interior of the church of Notre Dame, the cathedral of Noyon. It will be observed that the pillars of the nave are alternately heavy and slight, this arrangement pointing to an original vaulting according to the sexpartite system, as in Figs. 111 and 112. Furthermore, it will be noticed that the existing vaults are not at all of that character, but are built according to the simpler and more rational plan as shown in Figs. 105, 106, and others, which explain the same system. There can be little doubt that the original vaulting was sexpartite, and that the present vaults are of later date than the rest of the church, which has suffered frequently from fires in the wooden roofs.

Gothic architecture, therefore, was established before the close of the twelfth century as a complete style, capable of anything. It is customary to speak of it as the style of the thirteenth century, however, because the greater buildings of the early Gothic style were still rising, all through the half-century, 1200–1250. Notre Dame of Paris was finished before 1250 as we now see it, except the chapels and some other parts of the exterior.

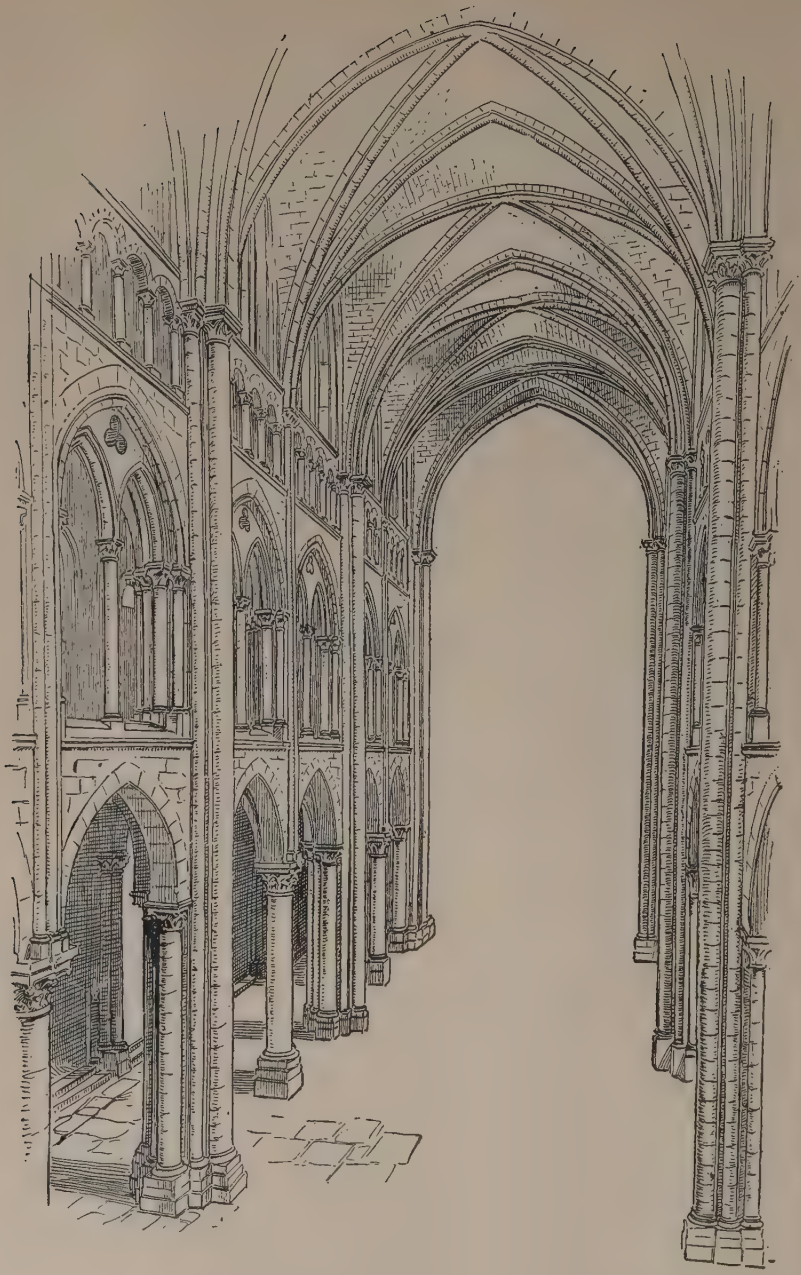


FIG. 121. Noyon, France: Cathedral. Nave (see FIG. 120).

Notre Dame of Chartres must have been complete by 1240; the north tower of course is later and the porches of the west front much earlier, and still Romanesque in type. S. Étienne (S. Stephen) of Bourges, a marvellous church, was not more than ten years behind the others. Notre Dame of Amiens was checked by want of funds, and was long in finishing, but its main lines were settled before 1240; moreover, every part of it as it now stands was built before the year 1300. Notre Dame of Reims offers a much larger proportion of late work, but even here the church is a church of 1220–1240, with later enrichments. S. Pierre of Beauvais is of the same epoch; the choir and transept only having been completed. These six are the giant cathedrals of France, and there is only one building worthy to be compared with them — S. Peter of Cologne, which, however inferior in beauty of sculpture and freshness of style in its details, reworked and modernized as they are, is a perfect cathedral of 1220–1250 as to plan and general conception. Two other first-class cathedrals were begun, SS. Pierre and Paul of Troyes and S. Juste of Narbonne, but only the choir of each was finished in the thirteenth century. Of the same epoch are the unequalled choir and chapels of S. Julian of Le Mans, the plan and general system of Notre Dame of Rouen, the whole of Notre Dame of Laon, almost a cathedral of the first class, and unsurpassed in artistic charm, the general plan and the whole choir of S. Gatien of Tours, and the whole or nearly the whole of Notre Dame of Soissons, Notre Dame of Senlis, S. Étienne of Sens, and Notre Dame of Coutances. All of these are cathedral churches, except Sen-

lis, which has lost that rank; and it is to be noticed how, in accordance with the strong episcopal and diocesan feeling alluded to above (p. 205), these cathedrals were begun wholly anew in the new style, all the Romanesque structure which had preceded each being removed.

No such thorough rebuilding was undertaken in the case of the parish churches. In some parishes the Romanesque church was left standing, and remains to this day, or has been destroyed in the present century. In others the Romanesque church was not replaced by a Gothic building until the fifteenth century. From these and other reasons the French parish church of the thirteenth century is not so familiar a type as the French cathedral; but it is none the less important. For the guidance of modern architects who build churches in imitation of the early Gothic style, the parish churches are even more often valuable than the great cathedrals, because they are so diverse in plan and distribution, frequently being without aisles or without transepts, not by failure of resources, but by the original plan; having sometimes central towers, sometimes bell-gables only, sometimes bell-towers as separate from the church as the Italian campanile. Moreover, they offer by turns the most tasteful and appropriate use of sculpture in limited amount and the working out of the Gothic ideal without sculpture more than here and there a carved boss or corbel. They are graceful in proportion beyond the smaller churches of other lands.

Together with the parish churches must be mentioned

the famous Sainte Chapelle[1] of Paris, which was built by Louis IX. (Saint Louis) during the years 1243–1247. It consists of two separate rooms, an upper and a lower chapel. The upper one is an unbroken room about thirty-three feet wide by one hundred long, including the polygonal east end, and about sixty feet high to the crown of the vaulting. The lower chapel is divided into a nave and very narrow aisles; this disposition being partly caused by the lowness of the room, about twenty feet to the crown. Buttresses of great projection, though narrow, rise the whole height of the exterior walls and take up the thrust of all the vaults. This structure then in its main design is a lofty Gothic church without aisles. This masterpiece of Gothic art shows us what the style would have been if the nave-and-aisle plan, with high clear-story, had not been in use. Most churches built, not on that plan, but with a single nave only, were, of course, small and simple, but the Sainte Chapelle is of the highest development of perfected Gothic. A comparison of this building (see Fig. 122),[2] with a great cathedral-church like Bourges or Chartres shows how perfectly the earlier Gothic was suited to great buildings with ground-plans of broken outline, with higher and less high parts, with exterior and interior variety, change and series of parts,

[1] The term Sainte Chapelle, or Holy Chapel in a peculiar sense, was used to describe a building containing and dedicated to relics of supreme importance, such as those of the Passion of Christ. That of Paris was built as an addition to the royal palace which stood on the largest island in the Seine, *l'Isle de la Cité*, nearly where the *Palais de Justice* is now; the Sainte Chapelle marking nearly the middle point of the former group of buildings.

[2] Consult also Fig. 115.

FIG. 122. Paris: Sainte Chapelle. Built 1243 to 1247 A.D.

and how much it loses when applied to a simple and regular structure of no great size.

Civic buildings were built on the same principles as churches, as far as they could be. A small dwelling-house would not have vaulted ceilings nor very large windows; and, therefore, all it had of the Gothic style was in its detail. A large hall would be vaulted, with pillars to carry the vaults in the middle or in two ranks like those of a church, and buttresses to take up the thrust. Instances will be given of such structures. Where the walls had to be very thick and solidly built, as in the case of the strong castles which were built all over Europe at this epoch, the vaulting would find abundant support and resistance to its thrust in the walls themselves. Where the vaulting of a room twenty feet wide is resisted by solid walls twenty feet thick, such vaulting is indeed perfectly secure; but this has very little to do with the true Gothic vaulting in which one vault balances and offsets another, and only the lightest possible buttresses are used to take up the thrust of the outermost compartments.

The Gothic style brought with it a world of varied detail, both architectural and sculpturesque, the first naturally resulting from the arrangement and structure of the building, the other coming of a development of the popular instinct for pure art, such as at certain intervals of time surprises the student of art history. Figure 123 shows how the tracery of the windows lends itself to the decoration of the structure both within and without. Within it shows dark as a system of bars gracefully com-

FIG. 123. Reims, France: Cathedral. Window of choir, about 1210 A.D.

bined and relieved against the light and coloured or gray monotone ground afforded by the glass. From without it shows light on the dark of the interior; and in this external aspect the tracery is combined with the mouldings of the arch forming the window head. Figure 124 shows one of the bays of the Sainte Chapelle at Paris, seen from without. It will be noticed that the exterior mouldings of the window arch are first a bead between two quirks A, then the re-entrant angle formed by the surfaces of the two stones AB, then a quirk and a prolonged ogee moulding filled with leafage. The mouldings of the window-tracery continue and carry out the system of convex and concave surfaces adopted. This matter of window-tracery will be discussed more fully in Chapter VI.; and the great rose-windows of the gables must be left for the same chapter. Meantime, the curious way in which the window-tracery affected the architecture of the time by serving as an ornament applied to many parts of the building, especially of the exterior, is shown in Fig. 125, one of the gables of Notre Dame of Paris.

The richest parts of the great thirteenth century churches are the doorways of the west front and the north and south fronts of the transept. A great cathedral would have nine of these superb doorways, each one enriched with elaborate sculpture in high relief or in the form of statuary. This sculpture is arranged alike on the sloping surfaces of the impost, the receding concentric arches of the door-head, the large triangular tympanum which fills the door-head and the *trumeau* or stout central upright which supports the tympanum and receives

FIG. 124. Paris: Sainte Chapelle. Window (see FIG. 122).

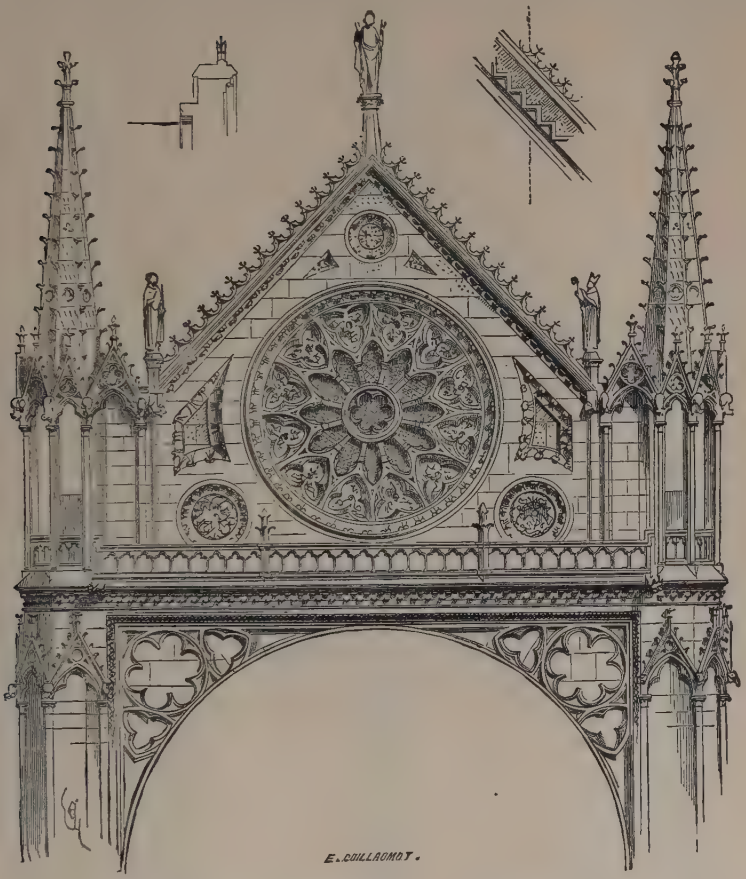


FIG. 125. Paris: Cathedral of Notre Dame. Gable of transept about 1260 A.D.

the swing of the heavy doors. Such a doorway is given in Fig. 126.

The towers carrying spires, which in theory would be among the most common features of the Gothic style, are not very common of a date as early as the thirteenth century. Those that existed have often suffered from fire

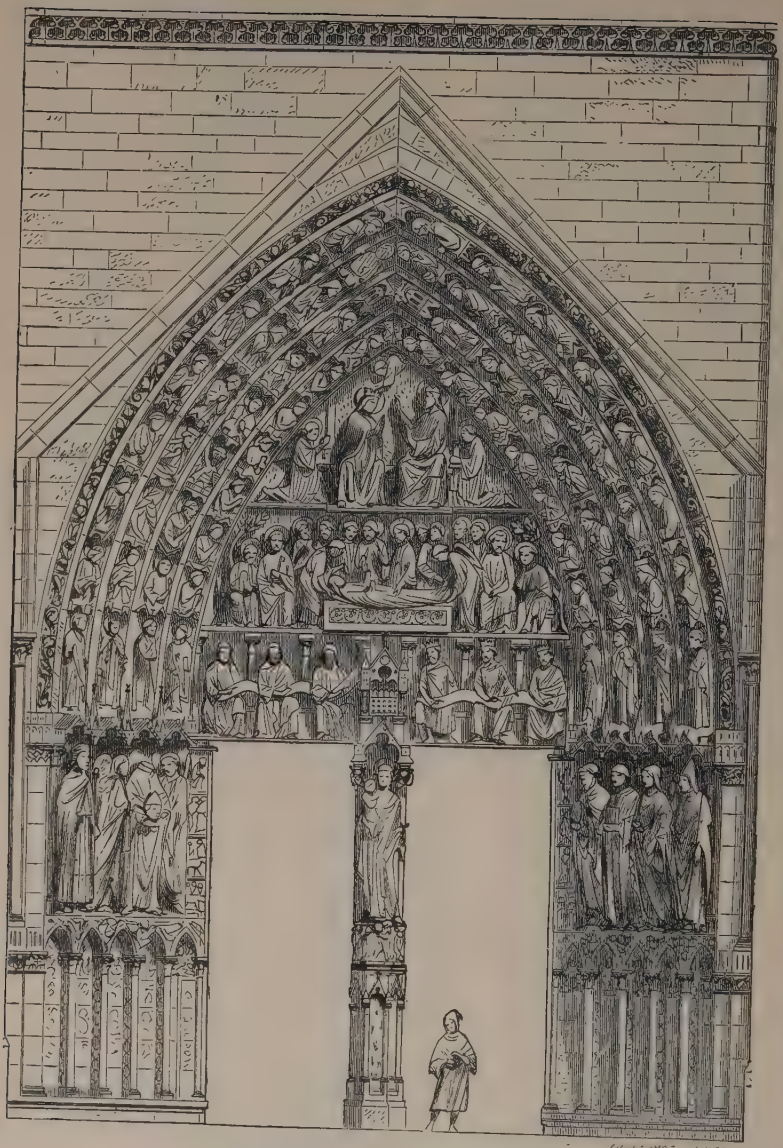


FIG. 126. Paris: Cathedral of Notre Dame. North door of west front, about 1210 A.D.

which has ruined their spires and pinnacles. The most admirable tower of the beginning of the Gothic style is the southern one of the west front of Chartres, and another of great beauty and of a few years later is that which occupies the same position in the cathedral of Senlis, a few miles northeast of Paris. The design of a thirteenth-century cathedral included, however, many belfry-towers with spires. Viollet-le-Duc has left us a study of what a church of the character of Reims Cathedral would have been had it been completed according to the original conception, which study is reproduced in Fig. 127.

As for the sculpture, it deals with plant form and animal form in abundance, in variety and with great freedom; it combines them in the most unexpected and the richest decoration, and it preserves at the same time great merit as sculpture. The human figure it takes as one more element of its design, and uses it boldly and well as a means of ornament; moreover, gesture, movement, and pose are admirably treated, and drapery, founded upon ordinary costume, is handled with great skill. A strong disposition towards portraiture, or at least the using of well marked individual types, is evident; faces are full of expression, and the face is made to conform well to the emotion expressed by the attitude. Finally in the masterpieces of the time, as in the porch-statues of Reims Cathedral, there exists a true sculpturesque achievement worthy to be considered beside that of the Greeks of Pericles' time. As to this matter of sculpture of the human figure it is to be observed that two tendencies are at work side by side; the figures are needed to help the architecture,

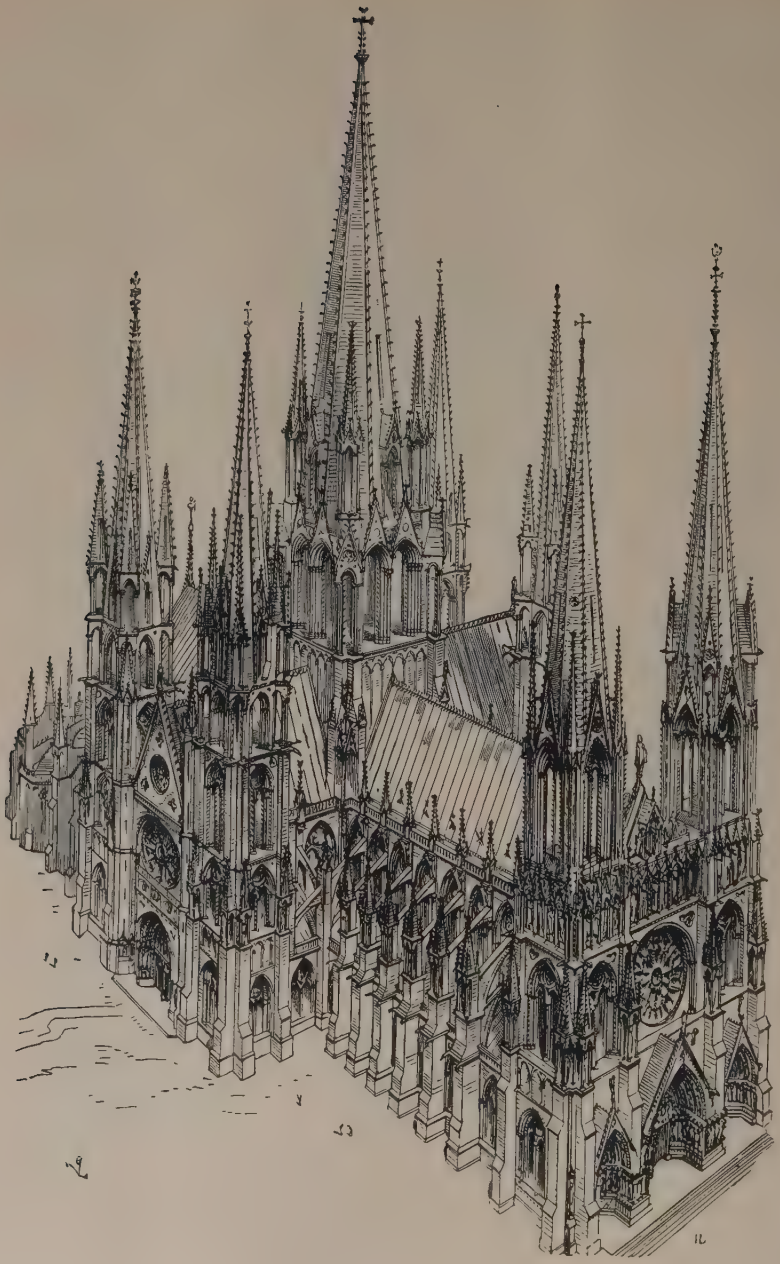


FIG. 127.

and they are also, independently of all architectural surroundings, the work of a sculptor who is eager to excel. The Greek of 450 B.C. was not thinking so much of his architecture when he modelled a figure; it was only when he took in hand a Caryatid or the like that he was an architectural sculptor at all, in the sense in which we must use the term of the thirteenth century men. These later workmen never forgot their porch, their gable, their arcaded gallery; their sculpture was intended primarily as a decoration, and its frequently very remarkable sculpturesque quality came of the practised hand and the creative genius which could design and execute that which was great in itself and yet greater in the combination of part with part.

There are few remains of domestic architecture of the thirteenth century, and of the years from 1150 to 1200 there is practically nothing left. An interesting house-front in the town of Saint Gilles (near Nîmes in the south of France) is Romanesque in style; but we have already seen how long the round arch style lingered in the far south. This building, moreover, has been restored in a destructive manner. Dwelling-houses of the thirteenth century there are, and in the strange *bastides*, built at command during the later years of this century, there are streets and squares faced with houses of uniform design, now much altered and defaced, but still valuable for purposes of study. The ordinary dwelling of the Middle Ages is not of a character to control or modify seriously the development of architectural style. Small, simple in its distribution, far less elaborate in construction than the smallest of the chapels ranged around

the choir of a large church, with floors framed of wooden beams and openings small and low, these dwelling-houses are of extreme interest to the inquirer into manners and customs and into the history of the people, and have a certain charm to the lover of archaic art; but the development of Gothic art went on without regarding them, and they followed as they could, adopting this and that detail of the church architecture in their neighbourhood. The public civic buildings of the time are all gone, unless we except the Synodal Hall of Sens, which having been nearly ruined by alteration was restored by Viollet-le-Duc in authentic manner, and the *Salle des États* at Blois, which is a very simple and unpretending room with as little architectural character as could well be given to the composition with a screen of columns carrying a seeming vault of wood-work. The great hall of Montargis exists in the engraving of Androuet du Cerceau. Of the Palace on the Island in Paris we have foundations, vaulted cellars, plans, and drawings. The halls, too, of certain strong castles like those of Coucy and La Ferté Bernard can still be traced. All that is interesting, however, in the actually existing monuments of civil and domestic architecture is to be found in the details of their decorative treatment, and none can be cited more important than the front of that strange house at Reims which is called from the large seated figures which fill the niches between its upper windows the House of the Musicians. There are four large square-headed windows, with mullions and transoms in the upper story, and five niches with cusped, pointed heads in the piers. Each niche contains a life-size figure, of which all but one represented

originally musicians playing on different instruments. Each niche has a hood-moulding terminating in sculptured bosses, and the arcaded cornice above is so laid out that one of its pairs of arches springs from a sculptured corbel which forms a key-stone to one of these arched hood-mouldings; each one of the five figures, moreover, rests its feet upon a large corbel of which a sculptured human figure forms the principal ornament. It is of great interest to observe how the builders conceded the large square window to the comfort of the inhabitants but insisted upon the pointed arch where the light was not to be obstructed by its spandrels. Figure 128 gives a restoration of one bay of this house by Viollet-le-Duc ("Dictionnaire de l'Architecture Française," article *Maison*). The drawing of the statuary is largely fanciful and the restoration of the ground floor unauthorized, although probable enough.

II

Of the lands not included in the modern France, Flanders, Hainault, and Brabant, and the northern provinces of Spain, received the new style in the purest form. The advance of Gothic architecture in Spain was slower than in western Germany, and much slower than in England, but it was peculiar in this, that it was always along the lines of true Gothic construction and the design resulting from it. The old cathedral of Lerida is of the years 1203 to about 1270, and it is a building in the transition style, the vaulting good Gothic, and the cloister, the porches, etc., built with pointed arches, but the windows

FIG. 128. Reims, France: "House of the Musicians," about 1260 A.D. Restoration of Viollet-le-Duc.

and doorways generally round-arched and the smaller details Romanesque. The fine tower is of a much later date. At Burgos is to be seen, on the other hand, an instance of almost perfect early Gothic, consistently used in the vaulting, the larger details and the sculpture of all those parts of the cathedral and its cloisters and outbuildings which are not overlaid or replaced by much later and very florid work. What is of the thirteenth century is exquisite, tasteful and simple. The porch and doorway of the south transept, though not so nobly designed as a fine French porch of the epoch would have been, is equal to anything in the beauty of the sculptured detail. The whole front of this transept is fine, and nothing except a certain flatness and lack of relief in the window-tracery and the arcades above it can be cited to prove this a work of an inferior school. Even finer, because far more stately in general design, is the west portal of Leon Cathedral, a work worthy to rank with the western doorways of Bourges. It may be that the work at Leon was directed by French builders and sculptors, but this would in no way particularize the work or make it less national than many other buildings in Spain and elsewhere. The skilled stonecutters of the day went from town to town, as their services were called for, and national boundaries in the thirteenth century were not as marked as they are now. A masterworkman from Bourges, Tours, or Paris would be called to Auch or Bordeaux; in one of those towns he would be half-way to Leon, and as much out of his native country as at Leon.

The provinces of Flanders and Brabant, which make up

the greater part of what we now call Belgium, were very like the lands to the south of them in their architecture. In some fine and decorative arts these provinces were in advance of Picardy, Normandy and Champagne, but not in architecture. The lovely church of S. Martin at Ypres, of 1220–1230, is but a French church of a few years earlier date, and the choir and lower parts of the nave of S. Gudule at Brussels are French of the Royal Domain itself in their style. Civic and domestic buildings are the special glory of a later epoch in these northern lands, but of the thirteenth century there is only to be named as of great importance the large cloth-hall at Ypres, and this is greatly inferior to the later buildings in most respects, though very imposing in its mass.

III

In Germany the great success of the Romanesque style in its later manifestations, the importance of the buildings which existed complete or nearly complete in this style, such as the cathedrals of Trèves, Mayence, Cologne and Bamberg, prevented a ready acceptance of the Gothic style when offered to the world about 1160, and still more prevented the development of a national German style corresponding to French Gothic in being an advance on Romanesque. The church of S. Martin at Cologne, which we have spoken of above as having an ideal Romanesque plan, has, covering the great square between the apses, a splendid tower, — one of the most beautiful in Europe. This tower can hardly have been finished before 1175, a

time when the choir of Notre Dame of Paris was well advanced in complete Gothic construction, but this tower shows no signs of any modification of the pure Romanesque type. This is the case with the German buildings of this epoch, nor is it surprising that the style once developed to the degree of perfection attained by this tower should have remained unmodified. It is not always in the history of architecture that changes go on rapidly. The Germans had reached a point with their Romanesque churches when the vaulting was on the whole satisfactory so long as they did not try to vault aisles running around circular choirs, and when the style in other respects answered all their requirements. The cathedral of Worms, built wholly after 1181 and purely Romanesque, is an excellent instance. About 1210, however, the cathedral of Magdeburg having been entirely destroyed by fire, its rebuilding was begun. It is a curious study. No doubt the architects had heard of churches built in France with pointed arches throughout; no doubt they saw the superiority of the pointed arch as being stronger in proportion to its width, and liked a novel form. Beyond this their adhesion to any foreign principles of Gothic architecture did not go. Figure 129 shows the interior of the choir of Magdeburg. The large shafts in the angles of the top of the picture rise between the windows of the clear-story and support the ribs of a single vault. This is an instance of a building with pointed arches, built at a time of full Gothic development a few miles away to the west, which shows no Gothic feeling at all. The piers are massive, and in fact the whole enclosure of the choir is really a

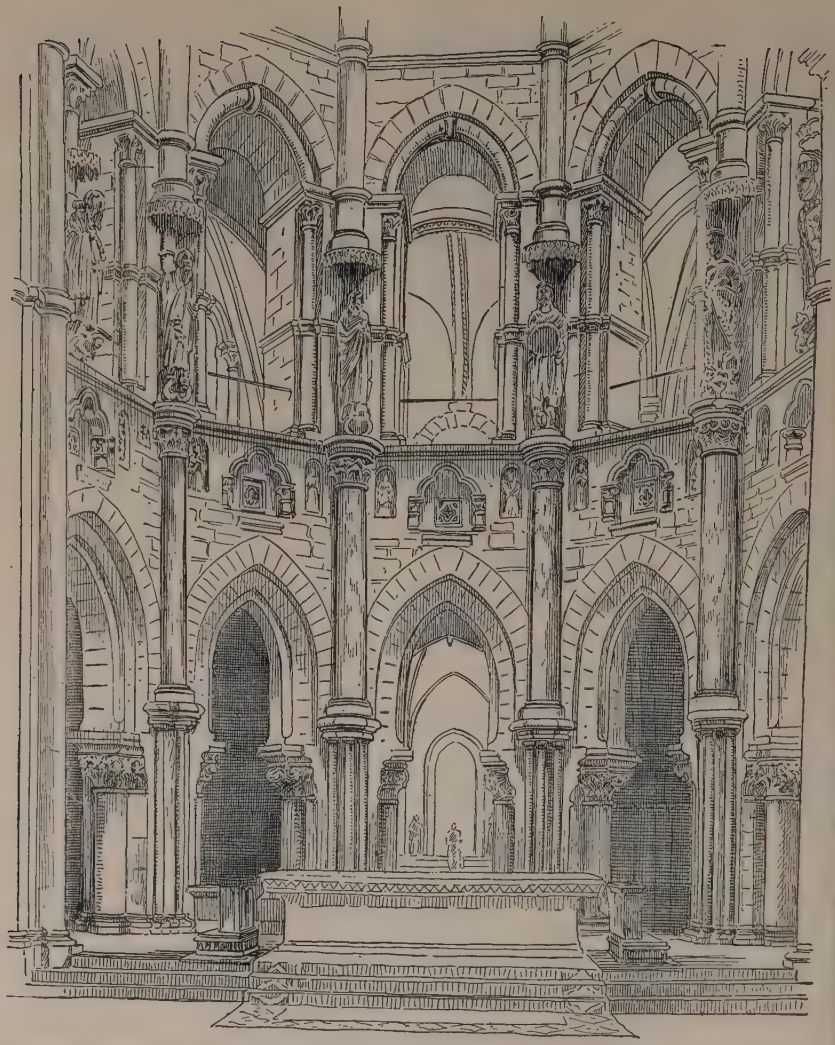


FIG. 129. Magdeburg, Germany: Cathedral. Interior of choir, about 1235 to 1240 A.D.

solid wall, with arched openings in it instead of a mere screen of columns. The essence of Gothic construction is absent. In like manner the exterior shows a high clear-

story wall without flying buttresses, their place being supplied by a peculiarly thick wall, reinforced by small, flat buttresses, the windows pierced in which wall, so far from filling the whole space, occupy about half of it. The details of Magdeburg Cathedral are extremely beautiful. The capitals are celebrated for their richness of sculpture in foliage and animal form as well, and the smaller doorways, of which we give an instance (Fig. 130), are unsurpassed by any work of the same epoch in Europe. The whole church is one of the most interesting and most worthy of close study that we possess. It is German Romanesque of a time so late that decorative sculpture had reached a high development, and it is built with pointed arches instead of round arches, but it is not Gothic because not constructed in the Gothic way. The church of S. Quirinus, at Neuss, of the same epoch, is another instance of this curious style, which cannot properly be called a transition style because it did not lead to a perfected and complete one.[1] S. Quirinus is Romanesque in plan and in vaulting, but the pointed arch is used freely in the blind arcades and in a few of the windows. A very singular evidence of the undecided and hesitating mood of the builders is seen in the extraordinary shapes of some of the windows, such as a trefoil combined with a triangle, a seven-lobed roundel ending in a narrow rectangle, and the like.

It is noticeable that the first building in Germany in

[1] The perfected Gothic of Freiburg (see Fig. 132) and of Vienna, Ulm, etc., mentioned in Chapter VI., is not a development of this thirteenth-century work, but comes of new study of French examples.

which the Gothic construction and resulting design were fully carried out is one the plan of which is extremely

FIG. 130. Magdeburg, Germany: Cathedral. Door about 1220 A.D.

unusual, and not to be identified with the characteristic plans of any style. This is the church of Our Lady at

Trèves. For the plan of this remarkable structure see Fig. 131. This church was erected between 1227 and 1243. Its exterior shows a lingering of the simple box-like forms and absence of the features of organized design which were inherited from the Romanesque period, but the interior is frankly Gothic even in the matter of lightness of vertical supports. Again, and to carry the contrast farther, the builders seem to have been as resolute to avoid the use of flying buttresses, as were the builders of Magdeburg Cathedral; but in the interior no signs appear of any resulting clumsiness of structure; the aisles have been so combined with the cruciform nave, that the thrust of the nave arches is taken up by the vaulting of the aisles. In order to bring this about, the aisle vaults are raised to an unusual height, and that which could not so well be done in a long church of the basilica type is managed here, — the heavy piers between chapels are utilized as buttresses within the enclosure. The curious church of SS. Peter and Paul, the cathedral at Brandenburg, in Prussia near Berlin, although generally classed by the German antiquaries as late Romanesque, probably because of the heavy piers in the

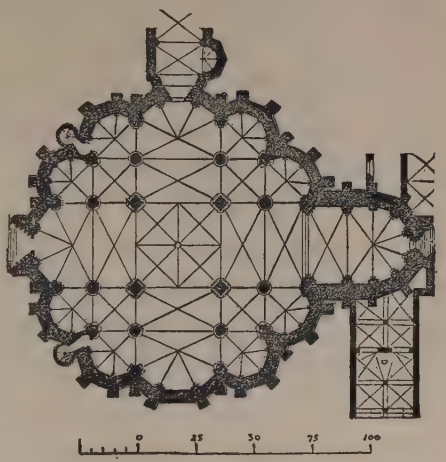


Fig. 131. Trier or Trèves, Prussia: Church of Our Lady. Built 1227 to 1243 A.D. Plan.

interior, is Gothic in the vaulting and in the spirit of the interior ornamentation. Nothing can be more interesting than the attempt to make a Gothic church at this early epoch (before 1295) of a building which had to be constructed wholly of brick. All this part of northern Germany is full of the most interesting ornamental brickwork, which adapts itself readily to the style followed in any case. The church of S. Elizabeth of Marburg has the peculiarity that the aisles are brought to the same height as the nave by means of stilted arches, while yet the construction is wholly Gothic. In short, every attempt seems to have been made by the German masterbuilders to adopt some part of the newly discovered system of building; as, for instance, its elastic strength and its adaptability, while seeking novel and independent styles of decorative design. It is, of course, to be regretted that none of these experiments were carried out to their natural results. The overwhelming influence of the rapidly developing Gothic of the kingdom of France, with its offshoots in Burgundy, Champagne, Lorraine, and Flanders, overcame all these local ambitions in Germany, and the great new style was copied at the expense of native originality.

The cathedral of Cologne is, as stated in the previous section, completely French in plan and general organization, a natural and instinctive modification of the cathedral of Amiens. The work went on very slowly, so that even the choir, the only part completed in the Middle Ages, was not roofed until the beginning of the fourteenth century. In consequence of this slowness of build-

ing, the architectural details both within and without are of much later date than the plan, and have little of the freshness of conception and vigour of thirteenth-century Gothic. The church at Freiburg-im-Breisgau is better worthy of study as a German Gothic church. It was almost entirely built between 1230 and 1288, only the chapels and the upper part of the choir being of later date. Figure 132 gives a part of the south flank of the nave, with the corresponding interior bays, of this beautiful church. Its marked peculiarity at once arrests attention; namely, its lowness as compared with the other Gothic buildings we have been considering. Every effort seems to have been made to keep down its height, and accordingly on a width of nave of nearly forty feet it has a height beneath the vaults of only eighty-seven. In order to bring about this result the aisles and clear-story are kept very low, the vertical jambs of the windows being generally shorter than the altitude of the arch which springs from them. What was the purpose of this innovation, if other than mere economy, it is hard to guess. One peculiarity of this church it is necessary to dwell upon for a moment, — the pierced spire, which seems to have been built between 1270 and 1300. Spires in England and in Spain, as well as in France, seem to have been always considered by the Gothic builders of this epoch as roofs, to be pierced by windows much as other steep roofs would be. Here, however, is the frank treatment of a spire as a piece of pure architectural decoration, the suggestion of a roof but not a roof; the natural and fitting culmination of a lofty tower, but not in a

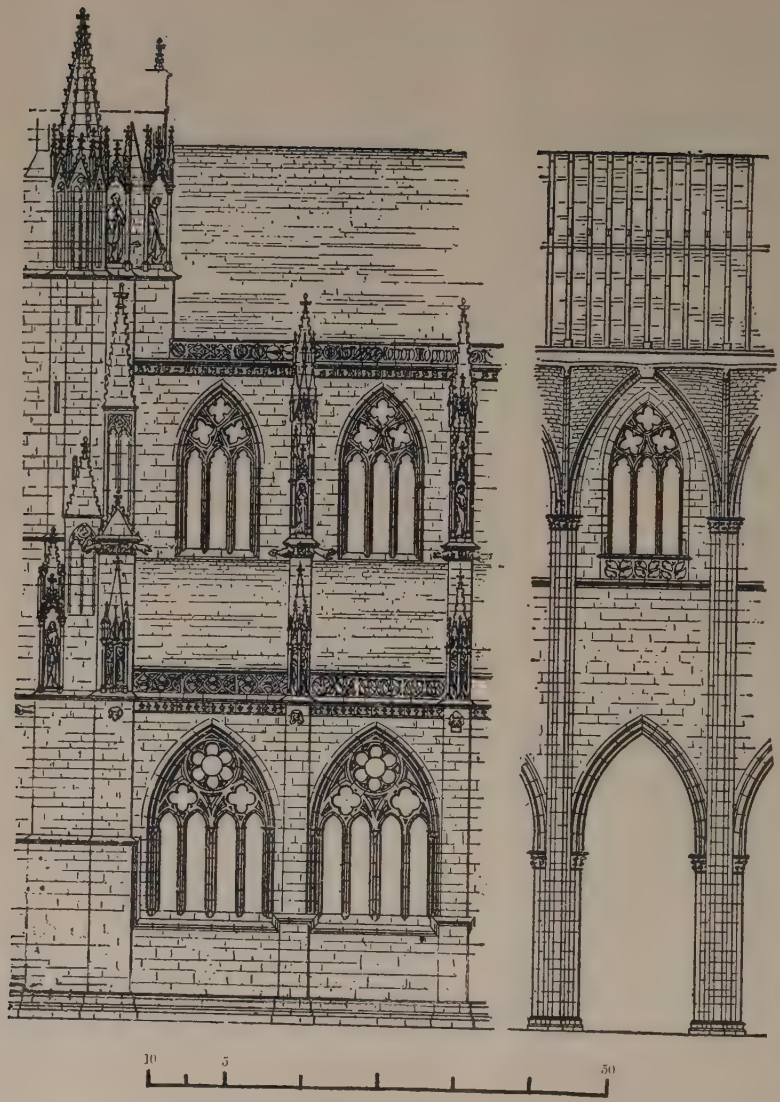


FIG. 132. Freiburg-im-Breisgau, Germany: Minster. Detail of south flank and of interior. About 1240 A.D.

proper sense the roof of a tower. The spire of Freiburg is made up of an octagonal belfry from which rise eight stout ribs or sloping pillars of stone, held together by crossbars at intervals, the whole forming the skeleton of a slender octagonal pyramid. The open spaces between the angle ribs, 13 feet wide at the bottom and diminishing to nothing, are cut by the crossbars at intervals of about 14 feet, and each of these open spaces is filled with a panel of pierced tracery. This skeleton construction rises to the height of about 160 feet above the octagon and terminates a tower the total height of which is variously stated at from 365 to 385 feet. The conception of a pierced spire pleased the Germans; they return to it again and again in the fourteenth century, and later in the great tower of Strasburg modified it into still greater richness and a still farther departure from the primal conception of it as a roof.

IV

The latest English Romanesque[1] is varied and elaborate, as has been seen in Chapter IV., and is peculiar in its tendency to use slender forms, thin pillars, and considerable decoration, purely architectural in character as distinguished from sculpture of natural forms. It is also

[1] The term "Norman" commonly applied to the developed English Romanesque should be avoided in that sense. Norman architecture is that which, on the continent, is distinguished from the architecture of the French Royal Domain by certain well-marked characteristics; and so far as the same architecture was carried to England, buildings erected there would also be Norman, but the evidences of this tendency are few, and they apply to pointed as well as to round-arched building.

peculiar in the large use of the pointed arch, mingled with the round arch, in buildings which are still wholly Romanesque in conception and in building. Thus, at Fountains Abbey, near Ripon, in Yorkshire, the nave of the church is entirely of Romanesque structure, for the walls which rest upon the nave arches are simply massive walls of homogeneous stone-work, without vaulting shafts, triforium or other galleries, or any constructional organization, and yet the nave arches which carry this wall are pointed. Kirkstall Abbey, near Leeds, in Yorkshire, has similar characteristics. The building is as simple in its make and conception as a Latin basilica, and is so far archaic as a piece even of Romanesque construction that there is no visible preparation for vaulting the nave or transept. The pointed arches which carry the clear-story wall, and which in Fountains Abbey spring from heavy round pillars of pure English Romanesque type, at Kirkstall spring from clustered piers, whose mouldings have nearly the same section as those of the arches. So far, a step seems to have been taken away from Romanesque building toward the elaborate constructional system which we call Gothic Architecture; but the signs of progress are confined to this feature; apart from it, Kirkstall Abbey church is a simple and exquisite piece of Romanesque church building. These churches are of the years between 1150 and 1170. A curious exception to the purely Romanesque character of the buildings with pointed arches built during these years is seen in the noble abbey church of Glastonbury in Somersetshire. The church proper and the very curious Lady-Chapel

have Gothic vaulting with sharply pointed arches; the transverse ribs heavy and decorated with leafage, while the diagonal ribs and wall-ribs are not heavier than in French work of the time. Underneath these fine Gothic vaults, in which the transitional character is marked only by the heavy transverse arches, the high windows are of pure Romanesque design with semicircular arches. There seems to be no doubt that the church and the chapel were each built, complete, between 1180 and 1190. In the Cathedral of Saint David's in Pembrokeshire (Wales), similar Romanesque windows are found beneath highly developed Gothic vaulting of sexpartite plan (see p. 194): but here there is no certainty as to the length of time which separated the vaulting from the substructure.

The beautiful choir of the minster at Ripon, in Yorkshire, is certainly of the closing years of the twelfth century, with the exception of the vaulting, and with the important exception of the two eastern bays. The western part of this choir, then, is perhaps as early a piece of pure Gothic building as there is in England. The transept and the three western bays of the choir are admittedly of about 1180, always excepting the vaulting itself. The piers, the arch mouldings, the vaulting shafts, the triforium, and the clear-story arcade are all pure early English Gothic, and the organization of the structure is complete; and yet round arches are used as freely here in connection with the pointed ones as pointed arches are used in the Romanesque buildings above named. This mingling of styles, at least in the

architectural details, remains characteristic of English architecture until a late period of the Gothic development. The earliest English piece of pure Gothic architecture is generally admitted to be the extreme eastern portion of the cathedral at Canterbury, that is to say Trinity Chapel and the nearly circular building adjoining it on the east and known as Becket's Crown. This work was begun about 1175 by a French architect, who was succeeded four years later by one called emphatically, and by way of distinction, William the Englishman. In this work round arches are freely used, but strangely enough they are used for the great archways of the nave, while the pointed arch is used for the much smaller openings above. This, however, is not the only surprising feature in this exquisite composition. The high vaults of this earliest part of Canterbury are so far from being Gothic of a strict type that the curves made by the shells which fill up the spaces between the ribs are almost everywhere circular. In other words, the vaults are nearly of the character shown in Fig. 88, while yet the rib-work, or in other words the constructive skeleton of the vault, seems to be as technically correct as anything in France.

The earliest English Gothic vaulting on a large scale is probably that of the choir of Lincoln Cathedral, which was built about 1210–1235. The first complete Gothic cathedral is that of Salisbury, built almost entirely, except the spire, between 1220 and 1260. In these buildings the general tendencies of English Gothic are sufficiently visible. In Canterbury there is to be seen that extreme

PLATE II. CATHEDRAL OF SALISBURY (WILTSHIRE) ENGLAND

Built 1220–40, spire about 1250. View from the S. W. of the Nave and western Transept.

picturesqueness of detail which combines well with the generally small scale of the English churches, and which goes far to harmonize the differing styles which in these cathedrals are brought into juxtaposition, Romanesque with early Gothic, and both with Perpendicular. In Lincoln is seen that disposition to make the vaulting convex rather than concave, always common in English work and which leads finally to the splendid novelty which we call fan-vaulting: — and in the pillars, archivolts and spandrels especially of the choir, that exquisite delicacy of floral and foliated sculpture which is the chief grace of early English Gothic. Finally at Salisbury (see Plate II.) we have a church carried out complete according to the English conception; small in its parts, neither wide nor high, nor capable of the effect of grandeur produced by mere enclosed space, this partly made up for by great length; extreme diversity of outline produced by double transepts, side-porches, sacristy and chapter-house outside of the main structure but grouped with it, Lady-Chapel projecting from the east end, — a diversity so great that an English cathedral often seems many buildings rising one beyond another rather than a simple structure.

It is necessary to dwell upon the English vaulting because it is the most essential peculiarity of the style, that which separates English work most decidedly from that of the continent and has given rise to the opinion, held by some, that Gothic architecture in the strict sense was not adopted in England. In Fig. 133 let *A*, *B*, *C*, *D* be the four points of support afforded by the nave piers. *O* is the crown of the vault, the point at which the diag-

onal arches on *A*, *D* and *B*, *C* meet. At Lincoln cathedral the ribs *AP*, *BP*, *CP'*, and *DP'*, are built; these ribs are, of course, half-arches, as was explained in connection with Fig. 113. From the points where they meet, *P* and *P'*, short ribs run to the crown *O*, and other ribs are carried on in the same direction to the corresponding points in the adjoining squares of vaulting. It is evident that in this system of vaulting there are more ribs than there is any need of. The curious piece of construction made up of the ribs *AP*, *BP*, *PO* in Fig. 133 is absolutely without utility. The builders had fallen in love with the effect of the inverted half-pyramid of which *B*, *O*, *O'*, in Fig. 133 is the plan, and which is seen so plainly in Fig. 135 below. English vaulting from this time on is extremely apt to run into this curious excess. It is not unpleasing in effect; its apparent excess of weight is not disagreeable and may indeed be thought to add to the truly Gothic effect of a heavy roof on slender supports; but it is not strictly Gothic construction. Gothic construction is simple and obvious; it resorts to the readiest means, it is reluctant

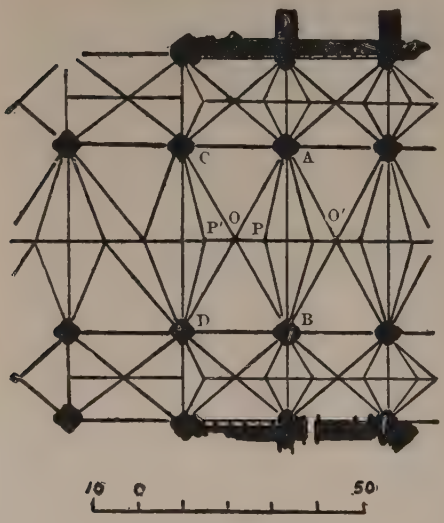


FIG. 133. Lincoln, England: Cathedral. Plan of choir vaulting. About 1225 A.D.

to use a cubic foot of stone unnecessarily; whereas this and much other English building of the time is sophisticated, in a sense.

It must be observed that the English derivations from pure Gothic building are very different in spirit and character from those which are found in Germany, as explained above. The German builder was always reluctant to abandon the massiveness of his Romanesque piers and walls; and his early Gothic buildings are of a somewhat ugly hybrid character. The Englishman, on the other hand, was quick to make even his round-arched work light and graceful, and his transitional or semi-Gothic buildings are very tasteful.

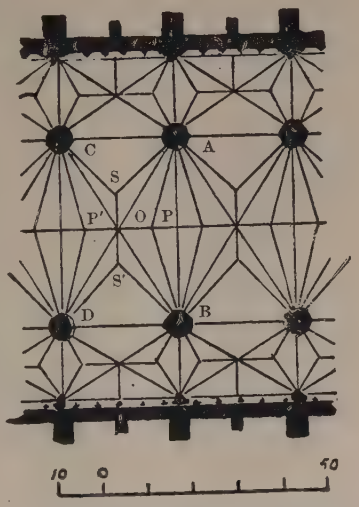


FIG. 134. Lincoln, England: Cathedral. Plan of nave vaulting. About 1235 A.D.

The left-hand half of the diagram (Fig. 133) shows the wholly exceptional vaulting of four bays of Lincoln choir. It is a whimsical attempt at novelty which led to no results.

The vaulting of the nave of Lincoln, which is a few years later than that of the choir, introduces a new element. The half-pyramids are made more complicated still. Figure 134 shows this new arrangement. *O* being the crown of the vault, and the ribs *OP*, *OP'*, sloping a little downward from *O*, the two new centres *S* and *S'*

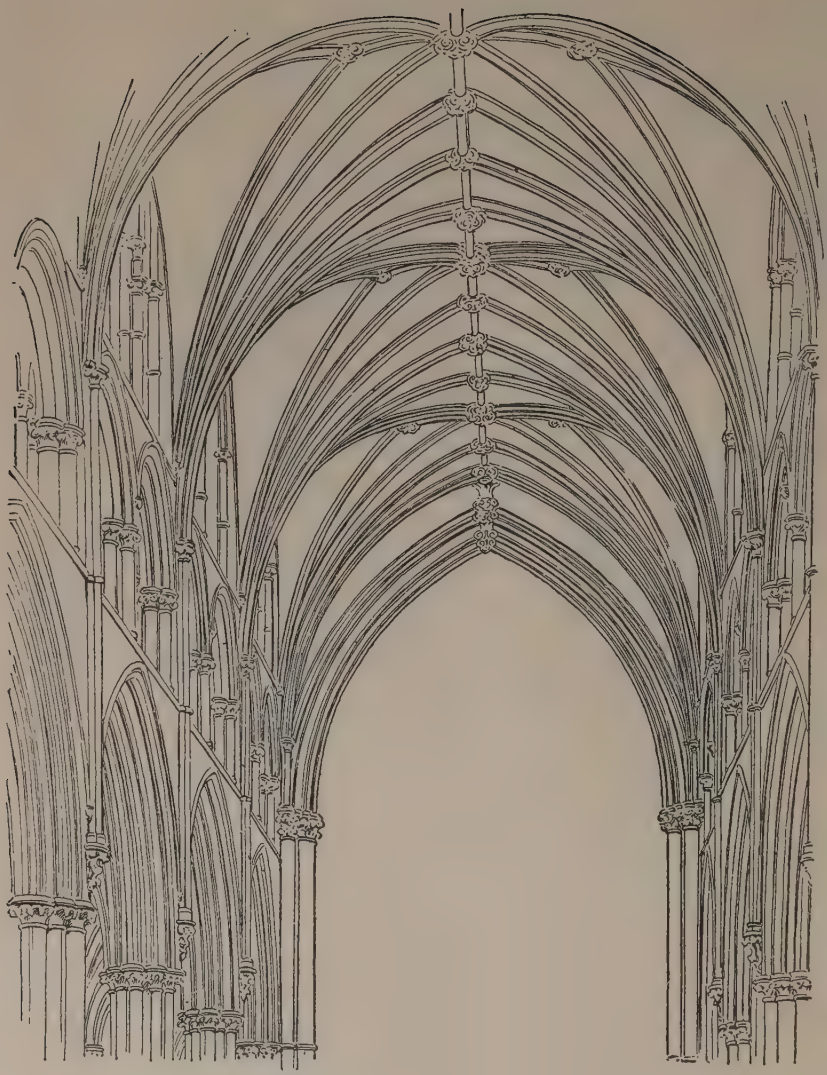


FIG. 135. Lincoln, England: View of nave vaulting (see FIG. 134).

are put in, the ribs OS, OS', slope at the same angle as OP, OP', and the new ribs AS, BS', etc., are built. The triangle ACS has no rib closing it at top, where the two sides arching up from A and C meet; but the angle where they meet, and which extends horizontally from S to the crown of the wall-arch AC, is horizontal and on a level with the point S. We have, therefore, a little dome-shaped central square, $SPS'P'$, in each vault of the nave. This is certainly a beauty in itself, but the number of unnecessary ribs is greatly increased by this arrangement, and the apparent weight of the vault is increased. See Fig. 135, which shows a part of the nave of Lincoln Cathedral, corresponding exactly to the plan (Fig. 134). It is evident that the builders loved the complicated pattern made by the ribs as seen from below. It is to be observed that the multiplicity of ribs tends to bring the vaulting down, near to the eye, and diminishes in appearance the already inferior height of the English naves.

The details, both architectural and sculptural, of the English churches of the thirteenth century are peculiarly worthy of study. They differ singularly from the French work of the same period. The forms of the windows are peculiar in this, that high and narrow windows were grouped together in twos, in threes, and in fives, and form in this way the main fenestration of a large building at a time when the continental churches were lighted by means of large traceried windows. Figure 136 gives one of these groups of lancet windows, as they are called, from the north aisle of Carlisle Cathe-

FIG. 136. Carlisle, England: Cathedral. Two bays of north aisle of choir.

dral in Cumberland. It will be seen that the wall below the wall-arch of the vault, which is called the lunette in the revived classical architecture of later times, is treated here, as in that later architecture and in contra-distinction to the Gothic architecture of France proper and the neighbouring provinces, as a wall into which windows are to be put in at pleasure, and considerable wall spaces left requiring decoration. This figure shows also an interesting arcade decorating the wall beneath the windows and most characteristic in all its parts of the English style of the thirteenth century.[1] Both documentary and internal evidence point to the existence of French and Italian influence,—the former in the architectural forms, the latter in the sculpture; but they point also to a native school of decorative sculptors, whose work deserves a very careful examination and analysis. The monument in Salisbury Cathedral, at the angle between the south choir-aisle and the eastern transept, is an excellent example (see Fig. 137). It was erected to the memory of Bishop Giles of Bridport († 1262), in whose time the cathedral was finished, except the spire.

V

Buildings with pointed arches, and with vaulted roofs built with ribs in the Gothic style, exist in Italy throughout the whole length of the peninsula, and among them

[1] The adjoining bay is shown in Fig. 136 as filled with a fifteenth-century perpendicular window occupying the whole height and nearly the whole breadth of the space within the wall-arch. The print from which this is copied is of 1839

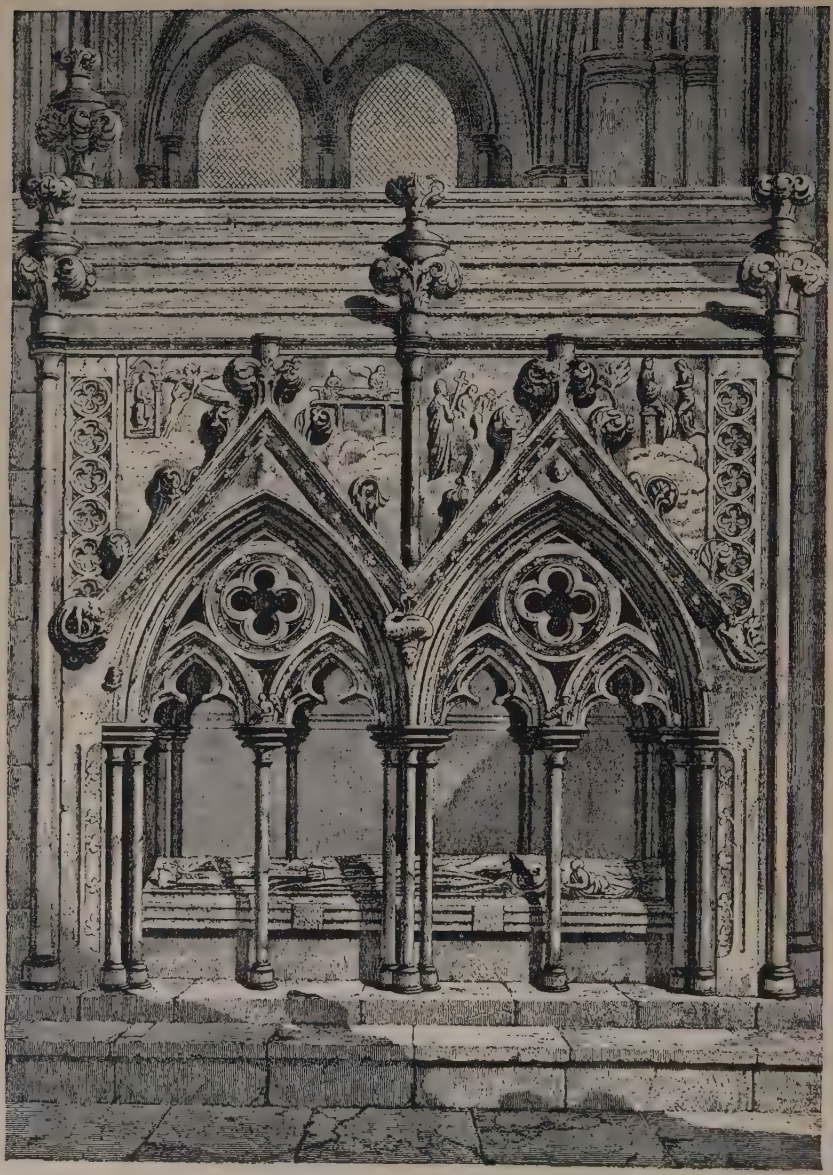


FIG. 137. Salisbury, England: Tomb of Bishop Giles of Bridport in the Cathedral. 1262 A.D.

are some which are known to be early in date. The church which is generally considered the earliest piece of architecture in Italy, in which the above characteristics of the Gothic style appear, is that of the abbey of Fossanova in the province of Rome, and not many miles southwest of the city. In this church a nave of seven bays and about thirty feet wide, flanked by low and narrow aisles, a transept without aisles, and a short choir of only two bays and almost without aisles, constitute the plan. The pillars which separate the nave from the aisles are large square piers, each one flanked by slender colonnettes; and the vaulting shaft of the nave, that is to say, the colonnette from which the nave vault springs, is carried on a corbel about six feet above the floor. The main vaults of nave and aisles are built without ribs, but the square at the meeting of the nave and transept is vaulted with ribs in a domical form and having an eye at the crown. The chapter-house is vaulted with ribs which spring from pillars made up of slender columns (see Fig. 138). As might be expected, the church has no flying buttresses. As common in Italy at all times, the roofs are of low pitch and the windows very small. In short, the church at Fossanova, which was certainly built between 1187 and 1208, is in no sense developed Gothic; it is Romanesque, with pointed arches, and with the additional feature of a rose window in the west front.[1]

The refectory of the abbey of Fossanova is shown in

[1] The very valuable book on *The Cathedrals of England and Wales*, taken from the London journal *The Builder* and edited by Mr. H. H. Statham, gives the assurance that this window has been removed by nineteenth-century restorers and early English windows substituted.

Fig. 138A. There is no pretence at vaulting, but large and stout arches are sprung across the whole width of the room, and these carry walls upon which rests the low-pitched roof. The picturesqueness of the design takes one at once to some little town in eastern France. If

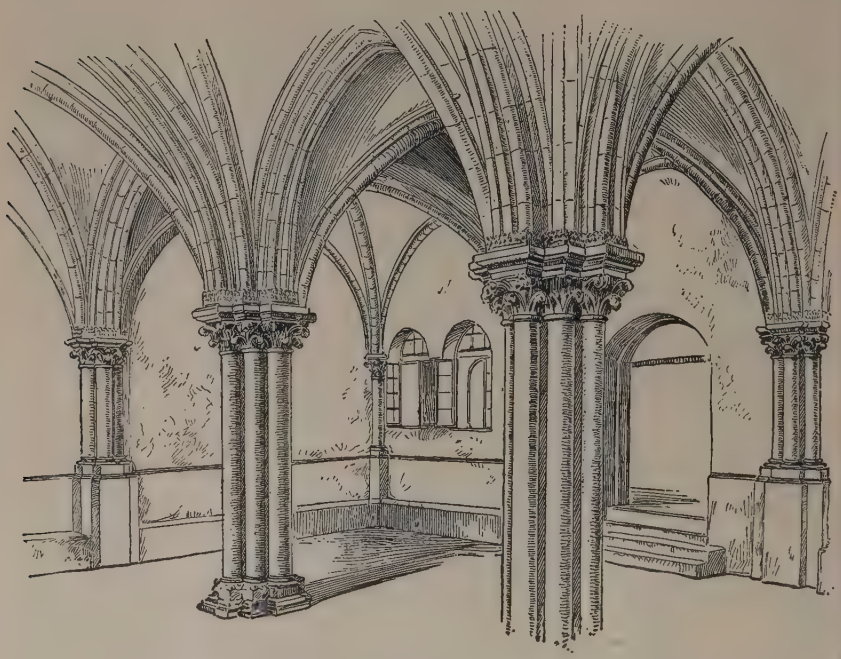


FIG. 138. Fossanova, Italy: Chapter-House. About 1225 A.D.

this interior is not Gothic in a strict sense, it is at least northern in feeling, in spite of the low pitch of the roof and the comparatively small amount of window space. It will be noted that the church, finished about 1205, the refectory about the same date, as near as can be judged, and the chapter-house about 1225, are roofed in three

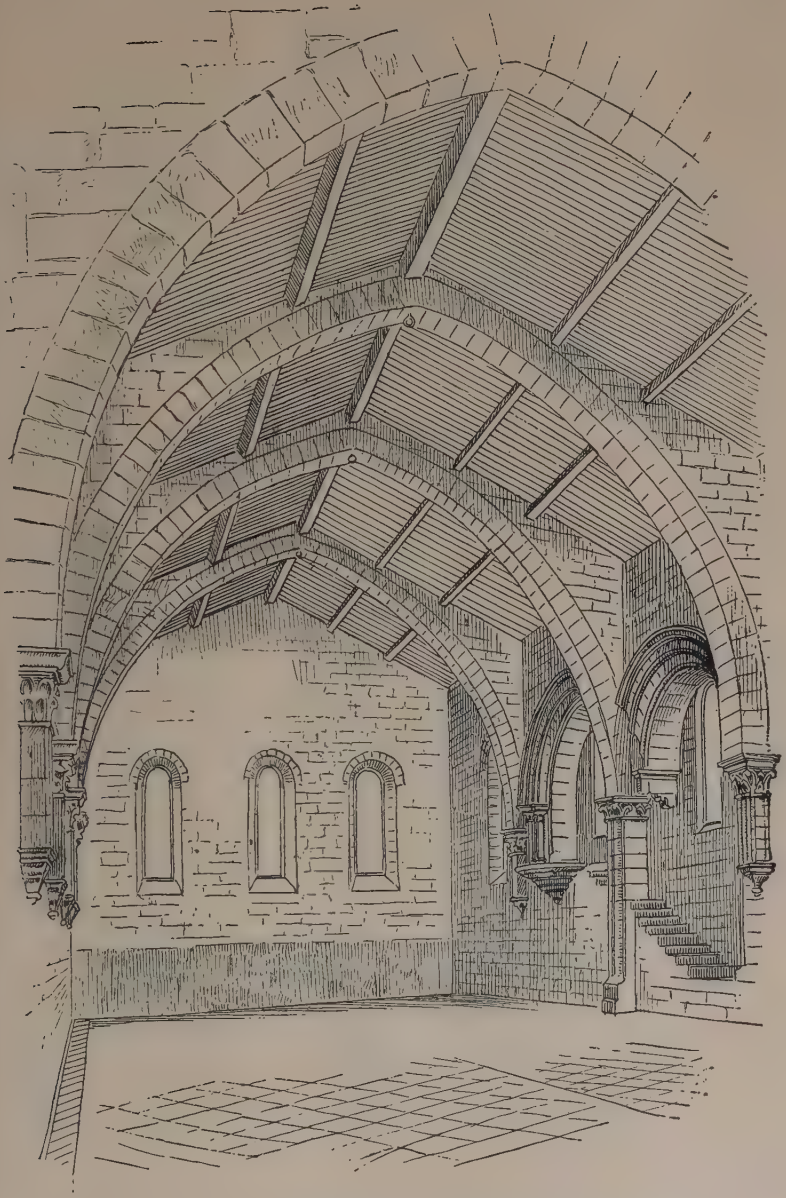


FIG. 138 A. Fossanova, Italy: Refectory. About 1205 A.D.

different ways; one by groined vaults like an early Romanesque building, one by the simple device not uncommon among Romanesque buildings, described on pp. 132, 133, and one by rib-vaults in the Gothic manner. Now it is clear that the builders of such abbeys as Fossanova were not decided in favour of any style. They were experimenting; the great northern Gothic style they knew of and would gladly have used, but the old Roman groined vault was more familiar to them, and a wooden roof on stone arches, cheaper. A most interesting style seems to have been on the point of developing itself in these abbeys, but some influence, probably the poverty of the institutions and the superior importance of the city churches, prevented it.

The ruined church of San Galgano in Tuscany is very similar to that at Fossanova in plan, in the arrangement of the openings, and in the style of the work, except that the architectural sculpture, as in the capitals, is much more elegant and highly finished. This church was begun in 1218, and was probably completed on the lines of the original design, although the work seems to have gone on slowly. The greater size of the windows is perhaps the only detail which marks this design as more nearly Gothic in the strict sense than the church of Fossanova. The conventual church near Chieti, on the Adriatic, and called by the people Santa Maria d' Arbona, contains a feature more fearlessly and frankly Gothic than either of the above-named churches. This is the vaulting of the square at the crossing of the nave and transept (see Fig. 139). The diagonal ribs, which are

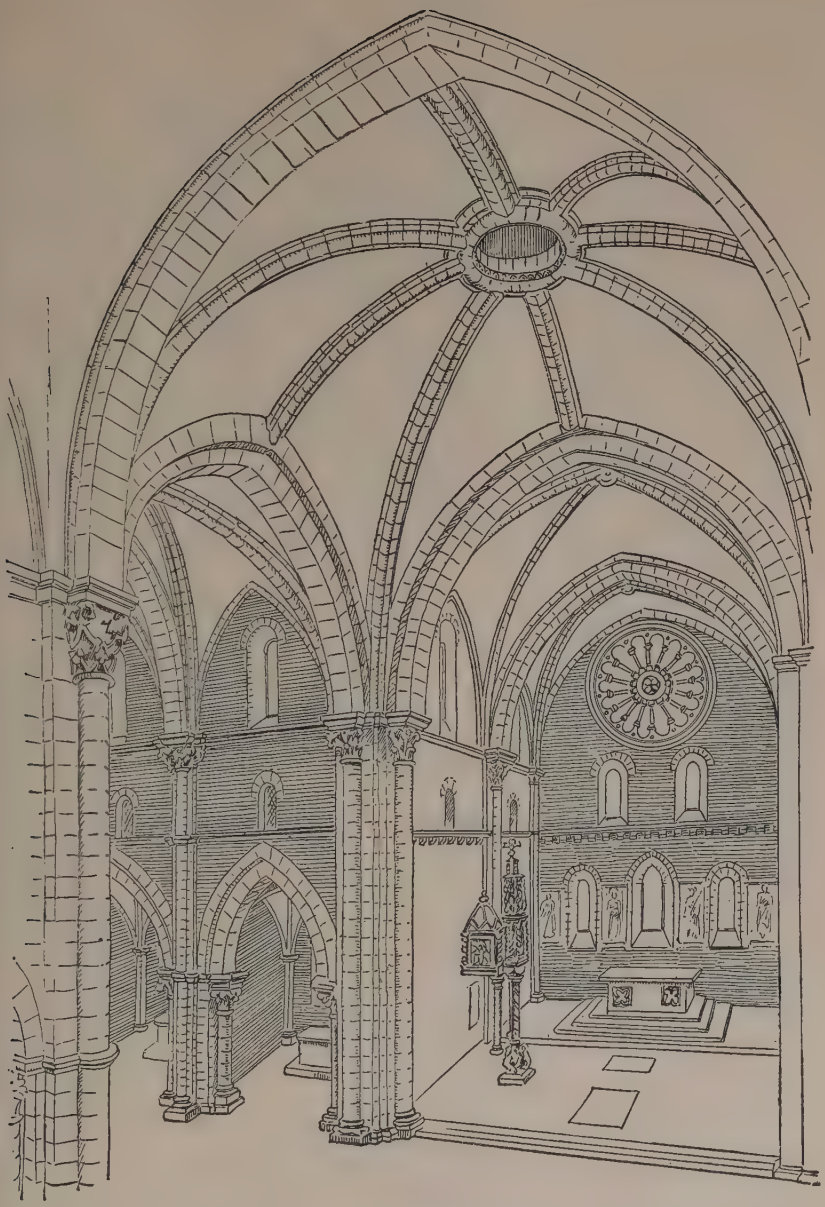


FIG. 139. Santa Maria d' Arbona, Italy: Church. About 1210 A.D.

built with a large eye at the crown of the vault, are semicircular. As the transverse arches though pointed are very blunt, the crown of the vault is much higher than the crowns of these arches. Secondary ribs are carried from the crowns of these arches to the central eye, the whole forming a very bold and striking piece of vaulting. As all the neighbouring bays are vaulted with diagonal ribs and well crowned up, this is a far more Gothic-looking roof than either of those mentioned above; but otherwise the church is Romanesque in character, having solid walls beneath the wall-arches of the vault, and small round-headed windows pierced in these walls. The church of S. Martino near Viterbo, northwest of the city of Rome, is peculiar in having vaulting of that system which we found in S. Ambrogio at Milan, and S. Michele at Pavia, that is, with one bay of the nave corresponding to two bays of the aisles; but this combined with pointed arches, and a polygonal apse vaulted by means of ribs, thrusting against well-marked buttresses on the exterior. The archivolts are moulded, though retaining the general shape of the outer and inner ring of voussoirs. These buildings, though showing strong influence from the North, are none of them Gothic in the sense in which contemporary buildings in France, Spain, or Flanders, are Gothic, and they are contemporary with buildings in which the Italian round-arched style is left almost unmodified, as in the important church of Chiaravalle, near Milan, and others in which there is no attempt at vaulting, and no preparations for it, as in S. Fermo of Verona.

FIG. 140. Florence, Italy: S. Maria Novella. Nave. Built about second half of thirteenth century.

The Italian treatment of the Gothic interior, which, as has been stated, is always the first thing considered in the Gothic style, is well shown in the famous church of S. Maria Novella in Florence, built about 1280. Figure 140 shows the vaulting of the nave and aisles. The difference of height between nave and aisles is so little that there is nothing to stand for the clear-story except the odd-shaped bit of wall enclosed by the arches above and below. The clear-story windows are replaced by small bull's-eyes less than three feet in diameter. The richer treatment of the same Italian-Gothic interior is well seen in the lovely church of S. Anastasia in Verona. In this church, heavy round pillars separate the nave from the aisles; these are carried up to a great height, because here also the aisles are high in proportion to the nave; they carry pointed arches decorated by simple mouldings and voussoirs alternately of brick and stone. The points of these arches reach exactly to the springing of the nave vaulting, so that what corresponds to the clear-story wall and triforium is, as in S. Maria Novella, a piece of wall bounded by curves above and below, and decorated by the two small, round windows which pierce it, and by bands of painted decoration. Figure 141 shows the arrangement of this vaulting seen from the nave, and the shape of the resulting piece of wall with its windows and painted ornaments. Figure 142 is a view of the exterior, in which it will be seen that the primitive appliance mentioned above (p. 198) as having preceded flying buttresses, namely, a series of walls built upon arches thrown across the aisles, is used here to take up the thrust of the nave vault. This view is further useful as showing

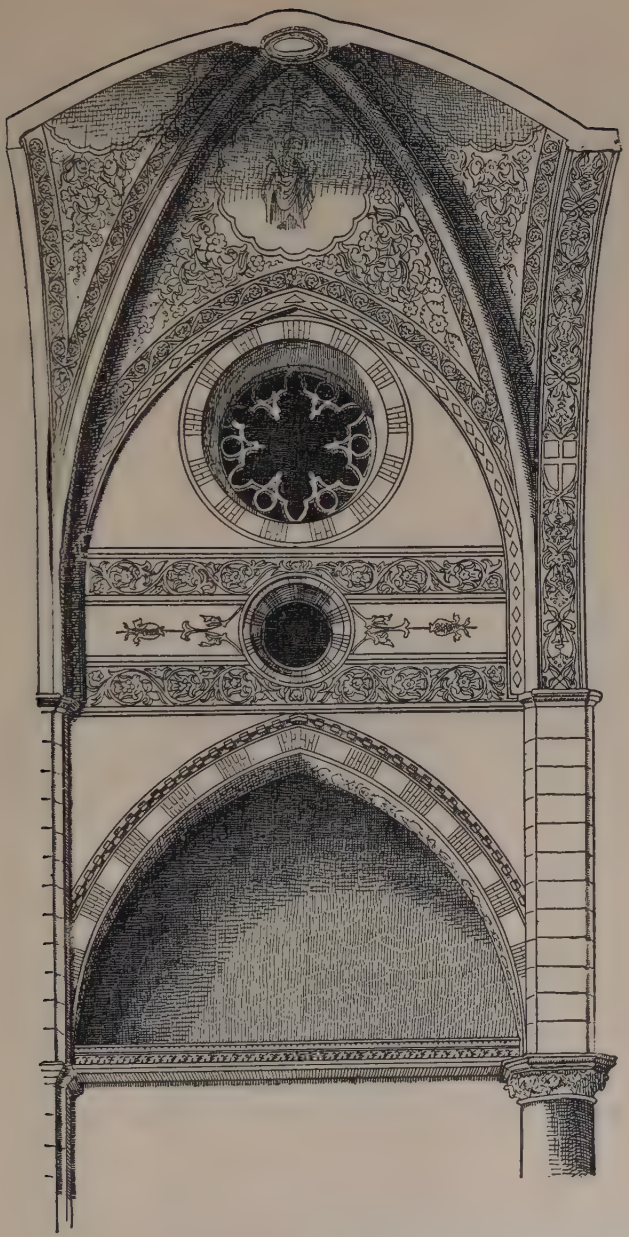
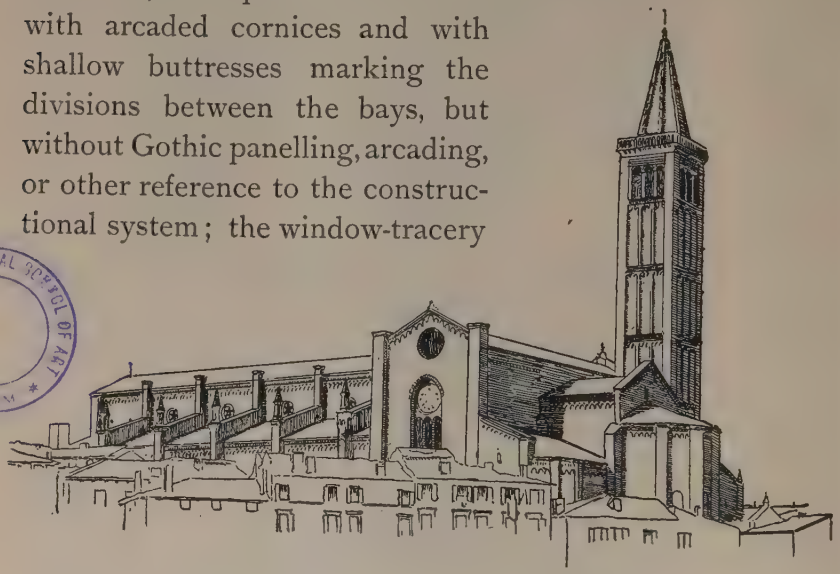


FIG. 141. Verona, Italy: S. Anastasia. One bay of nave. About 1270 A.D.

at once many of the features of churches in the Italian-Gothic style. The low-pitched roof; the small windows; the comparatively large size of the windows in the ends or fronts of the transepts, which with those in the west fronts are more counted on in these churches than the clear-story windows; the plain brick walls with arcaded cornices and with shallow buttresses marking the divisions between the bays, but without Gothic panelling, arcading, or other reference to the constructional system; the window-tracery



NATIONAL SCHOOL OF ART NOTTINGHAM

FIG. 142. Verona: S. Anastasia. Last years of thirteenth century except tower.

consisting of openings pierced in a slab, the openings themselves being dwelt upon as forming a pattern in dark on light; and finally, the square plain straight bell-tower built more or less apart from the church itself: — all these are to be seen here as well as in any example that could be furnished. The style has undoubted charm. There are many persons who find it appeal to their sympathies more than true French Gothic. Its very lack of finish and of

organization, its broad plain walls leaving room for paintings within, and for decorative facing of marble without, when the cost could be met, these and such other peculiarities appeal to the Southerner as against the Northerner in sympathy and in taste, and appeal also to the student who in art loves painting, let us say, rather than architecture. To thoroughly enjoy the architecture of a French cathedral, one must have the natural or acquired sense of organism. The structure before him must appeal to his sense of what is perfectly understood and well thought out as a system of building, or he will find it too complex. The Italian buildings, with their unconsidered, careless structure, as of a style only half understood and not thought important to study out; with their broad, sun-lit surfaces of plain wall, and their beautiful details set in here and there as if by accident, will please such an art-student better than the perfections of Bourges Cathedral or the Sainte Chapelle.

The beautiful and famous church of S. Francis at Assisi has its inner wall spaces covered with paintings of great decorative value, and in these the pictures of sacred subject are framed and set off by borders and friezes of the most varied and well-composed ornamental patterns. Nowhere in European art are to be found more successful designs in scroll-work and non-natural leafage; and nowhere is the true value of such ornament, as a frame and a foil to representative art, more plainly to be seen. Figure 143 gives one bay of this structure, showing the upper and the lower church. Comparison with northern Gothic interiors, as in Figs. 118, 121, and 135, will show the vast

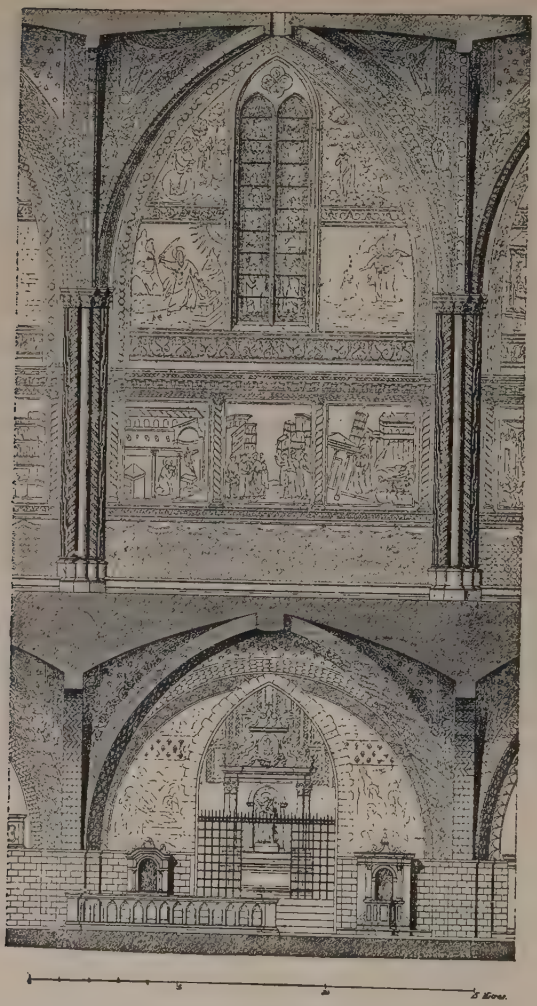


FIG. 143. Assisi, Italy: S. Francis. One bay of upper and of lower church. First half of thirteenth century.

difference of conception and of purpose between northern and southern builders.

It must be remembered that the Italians have never

been a building race, in the sense in which the Egyptians, the Greeks of 500 B.C., the Byzantines of 500 A.D. and the Gallo-Frank populations of 1200 A.D. were building races. Under the Roman Empire, engineering skill was developed to meet the new needs of a world-wide administration, and to provide lordly structures for it, and Grecian sense and power of art were at command. Except during those great years, 50 B.C. to 250 A.D., no Italian buildings were of any consequence, as buildings, until, in the fifteenth century, scientific students of construction began to build in a scientific way. Even then skilful building was rare. Beautiful sculpture, and painting of royal splendour, found a home in buildings put up under the immediate direction of the sculptors and the painters themselves, the ablest that the world had known since the time of the Greeks; but these artists were not skilled builders, they had not the building instinct; and the Gothic of Italy became what other Italian styles had been before, and were to be thereafter, better in everything than as a system of organized and intelligent building.

CHAPTER VI

THE ARCHITECTURE OF WESTERN EUROPE, 1300 TO 1420 A.D. The Progress of Gothic Architecture hindered in France by War and Popular Distress. In Flanders and Spain its Development is more Continuous. In England and in Germany Growth is Rapid, and the Style becomes more National. In Italy Beautiful and Strong Artistic Feeling still fails to make a National Gothic Style.

I

In the city of Rouen is a famous abbey church, more admired by travellers and more insisted on in guide-books than even the beautiful cathedral of that city. This church of S. Ouen, begun in 1318, was built within the course of the fourteenth century, except the west front and towers, which are modern and are not even on the plan of those originally proposed. Figure 144 gives the plan of this church. Plate III. gives a view of the exterior from the southeast. The important thing to note in this design is the complete organization of the structure. There are no hesitations visible, no changes of programme made in the course of the work; the parts grow naturally out of each other from foundation to lantern. A curious instance of the complete method followed by the builders is seen in the flying buttresses where the choir and south

transept form their re-entrant angle. The flying buttress which takes the thrust of the vault of the south transept bears upon the slender shaft of the westernmost choir-buttress, and then by another flying buttress upon the corresponding shaft of the next choir-buttress. This second slender shaft would be insufficient, but that it is heavily loaded and so maintained in place by the weight thrown upon it above, consisting of the double flying buttress of the great clear-story vault. It will be noticed that not

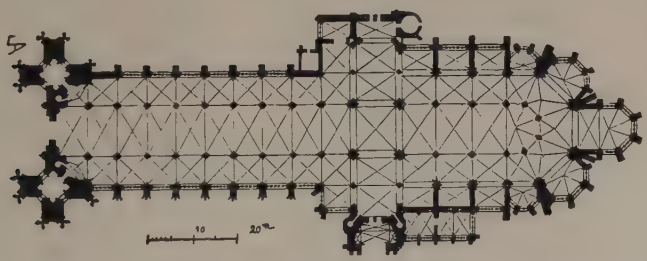


Fig. 144. Rouen, France: S. Ouen. Built, except the chapels, between 1320 and 1350 A.D. West end as originally planned.

only these small shafts and pinnacles, but also the outermost buttress piers, where they rise clear of the chapel roof, are extremely light. These grow larger above than they are at the level of the gutter, overhanging on the inner side towards the church very considerably, and this overhang is most carefully arranged to counteract the outward thrust of the flying buttresses. It will be seen, too, that the great windows of the clear-story fill the whole space between the slender piers against which the flying buttresses are built. The stone arch which closes these window openings at the top is also the wall-arch of the

vault within; that is to say, there is no wall whatever here, for the triangular spandrels showing above this window-arch are merely the outward facings of the mass of masonry which fills up the haunches of the vault within and keeps that vault in place. There is nothing new as to principle in all this. It is the system of the thirteenth century carried out in a perfectly legitimate way. In fact, the fourteenth century has not much to offer in the way of new principles; the theory of Gothic construction was complete in France by 1250, and there seemed nothing to be done but to go on and seek for still greater size of window surface and still lighter pillars of support. Moreover, the thirteenth century had built and begun to build so many and so large churches that the fourteenth century had little to do but to further adorn the finished ones and carry the others to completion.

In undertaking this task of completion and decoration, one of the ideas of the fourteenth century was a row of chapels along the aisle walls and a ring of them where the aisle turns round the choir at the east end. This feature is well seen in both its forms at S. Ouen. The little building in the extreme foreground of Plate III. is later; the chapels we are discussing are those structures built in between the buttresses. On the south wall of the choir they have square pyramidal roofs, and each has one large six-light window. Where the aisle turns round the *chevet*, these chapels take a polygonal form with buttresses at their angles and polygonal pyramids for their roofs. Some most delicate and subtle specimens of vaulting are seen in these radiating chapels, but the principles involved are not novel.

PLATE III. CHURCH OF ST. OUEN AT ROUEN (SEINE INFÉRIEURE) FRANCE

Built 1318–30; Central tower, Porch and low foreground structure, XV century.
View from the S. E. of the choir and Transept.

The lantern of S. Ouen, which takes the place of the massive central tower forming a part of some thirteenth-century cathedrals, is novel in appearance, but in no respect different in character from those more massive structures. It may be compared with the central tower of the cathedral at Salisbury, which is a little smaller in plan. The builders of the French cathedrals of the thirteenth century rather avoided the large central tower, but the smaller dimensions of Salisbury Cathedral and of S. Ouen make such a tower more feasible, and its beauty as an architectural feature could never have been ignored. Salisbury is unique in the world in this respect, the tower having its full size carried up to a considerable height and a solid stone spire to roof it, rising to a height of 400 feet. What the fourteenth-century architects thought of the question is well shown in the case of S. Ouen, where the light lantern is kept down to a height of 270 feet.

It seems that there was not in France, as it then existed, one other considerable church built entirely in the course of the fourteenth century. The cathedral of Clermont-Ferrand was carried on westward from the thirteenth-century choir; the cathedral of Limoges, begun at the east end toward the close of the thirteenth century, has its very interesting choir and transepts practically of the fourteenth century; and the cathedral of S. André at Bordeaux saw its beautiful choir and north transept, begun during the brief period that the kings of France ruled there (before 1302), continued and completed. The wonderful church of S. Urbain at Troyes would require a long analysis to fully explain its originality and boldness, but it is a work apart,

not an important step in a general process of development. It was never completed. In the farther south some remarkable modifications of Gothic art are to be found, dating from this epoch; at Narbonne a choir of immense size and great richness was built before 1350; S. Cecile, the cathedral at Albi, a fortified church of the most unusual and surprising character, has all its interior of a bold and striking Gothic construction, while its exterior is almost that of a feudal fortress of red brick. Instead of such an exterior as that shown in Plate III., in which the clear-story wall rises above the broad roofs of aisles and chapels and is surrounded by the elaborate belt of flying buttresses, buttress-piers and pinnacles, the external wall of Albi rises straight from its foundations, one hundred and sixty feet at the lowest point of clear vertical height. Within this great wall, broken only by slightly rounded projections and pierced by very narrow windows, there is a broad nave flanked by chapels in two stories. The cathedral of S. Nazaire at Carcassonne, of the same epoch, nearly repeats the forms of the northern vaulting, but with this peculiarity, that the aisles are brought to the same height as the nave. It may be thought that this system of building was intended chiefly to admit more light into the church, or that it was desirable to provide one uniform flat roof intended to serve as a platform for machines of war; for the *cité* of Carcassonne is nothing but a fortress, and the cathedral stands within fifty feet of the ramparts, in a place liable to attack.[1] Figure 145 shows part of the

[1] The present roof of the choir and transepts is built up above the vaults in a slight inclination, and is tiled, but it is very probable that it was intended to

eastern face of the cathedral of Carcassonne, including the chancel, and it will be seen from this how the fourteenth-century workmen undertook the task of building a great

FIG. 145. Carcassonne, France: Cathedral of S. Nazaire. About 1320 A.D.

form a flat platform, flagged with stone, for the placing of engines of war in case of siege; indeed, the west end is marked by a strong crenellated wall. The cathedrals of Narbonne and Béziers and the church of Les Saintes Maries near Arles are strongly fortified.

hall with pillars to support its vaulted roof, but without any difference in height between nave and aisles. We have already seen in the case of the Sainte Chapelle of Paris how the thirteenth-century workmen composed the exterior of a vaulted church without low aisles and therefore without flying buttresses. The Carcassonne church gives us the same system carried out on a larger scale and in the more developed style of eighty years later; for, when the aisle is as high or about as high as the nave, the thrust of the nave vault is taken up by the aisle vault and it is the latter alone which needs to be buttressed outside. It is rather noticeable that not only have the slender uprights of the great windows, the mullions between the lights, been reduced to almost incredible tenuity, — six inches in width and thirteen in depth for a clear vertical height of over thirty feet, — but the window jamb with its mouldings has come down almost to nothing. It will seem to most lovers of Gothic architecture that a great deal is lost in losing the concentric mouldings which follow one another, ring beyond ring, and draw their delicate lines of shade and shadow around the window-heads of the Sainte Chapelle (Figs. 122, 124). The reason for the change is of course the complete disappearance of *the wall* from the matured Gothic architecture. The triangular spandrels above the window arches being now the exterior face of the solid parts of the vaulting, and there being no wall below them other than the sheet of window sash held in light framework of stone tracery, it was natural to set this sheet of glass, lead sash, iron stay-bars, and stone rods well toward the exterior face

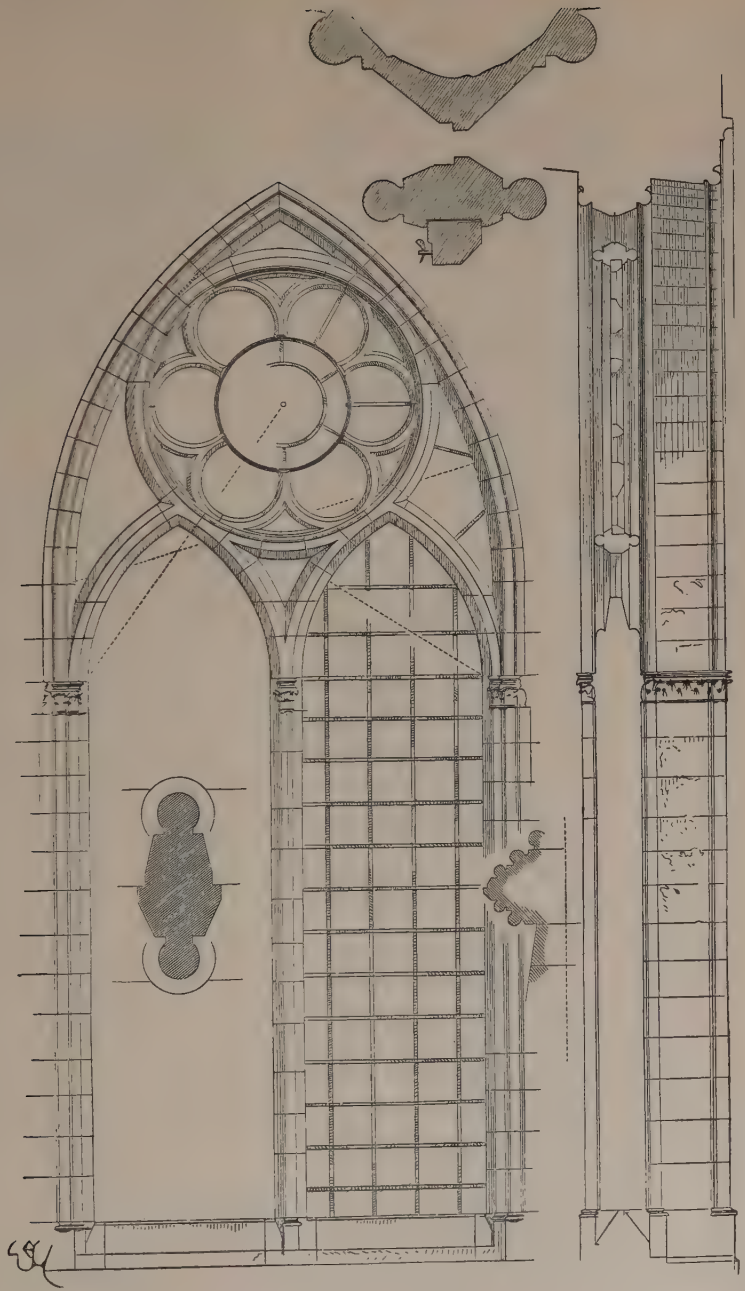


FIG. 146. Reims, France: Cathedral. Window of nave. About 1240 A.D.

of the stone spandrels above mentioned. There was then only the thickness of a few inches in-and-out, and there was practically no width at all — no wall space whatever, except at top above the pointed arch — where mouldings could be cut. The window itself filled all the space between two buttresses, and the small mouldings that remained must be looked upon as part of a constructional necessity rather than as a relic of the thirteenth-century design.

We must here speak of the Gothic window tracery, for although this was but a detail of minor importance in the estimation of the artists who conceived it first and those who developed it, — their minds being fixed on construction first, proportion second, and sculpture third, — it has received a factitious importance in modern thought as being the one part of Gothic ornamentation that could be accurately copied. The general theory of Gothic window tracery is the division of a large window by vertical uprights which we call mullions, and the carrying of these mullions, as they approach from below the spring of the arch, into patterns which shall fill more or less gracefully the pointed head of the window. Perhaps the simplest form is the one shown in Fig. 146, and the natural elaboration in case of a larger window is that shown in Fig. 147. When the window is of such width that three divisions are better than two or four, some such arrangement suggests itself as that in the diagram, Fig. 148. Another plan is that shown in Fig. 149, where an equilateral triangle is arranged beneath the head of the window arch, and the central light between the mullions has its arched head

lowered to meet the large triangle. Within these larger divisions of the window space smaller subdivisions were freely inserted, and these in turn are varied and modified by cusps, as they are called. One set of mouldings is used

Fig. 147. Paris: Cathedral of Notre Dame. Window of a chapel. About 1320 A.D.

for the largest stone bars of the tracery such as the mullions and the arches that spring from them; a part of this set of mouldings is used for the next smaller set of window bars, and so on, the cusps having the simplest section. The system of combination of the mouldings

forming these tracery bars is not very elaborate. The full group of mouldings is used in the principal parts of the tracery; that is, the two arched heads of the main divisions

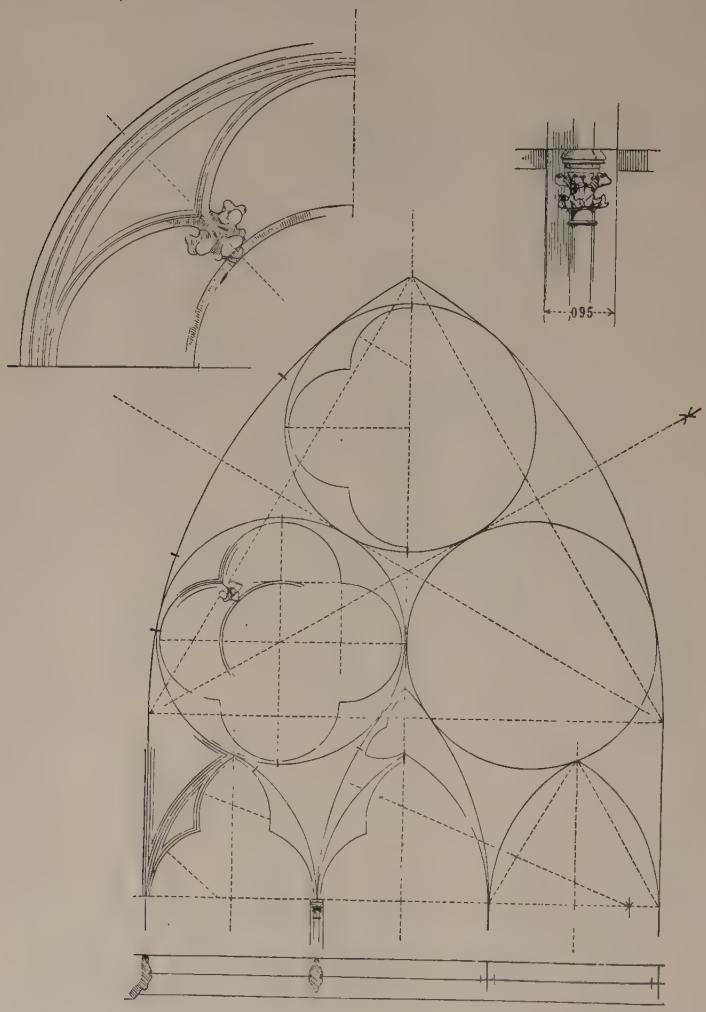


FIG. 148. Troyes, France: S. Urbain. Diagram of a window. About 1260 A.D.

and the large circle which rests upon them and unites with them (see Fig. 147), while the secondary bar with a smaller cove generates the four subordinate arches and these only, and the minor bar, consisting only of a flat and two coves, generates the cusps. This systematic use of the mouldings is hardly recognized until the fourteenth century; thus in Fig. 146 the shaded sections of the tracery bars, if compared with the similar sections in Fig. 149, will be seen to be much less carefully organized. The beautiful traceries of the second half of the thirteenth century are generally built without any such logical arrangement, but inasmuch as the stone tracery of large windows is a perishable part of a building, it is apt to be of later date than the surrounding masonry, and but little remains of early date. The Germans developed this geometrical laying out of the tracery with great enjoyment, and their fourteenth-century churches treat it with great respect; in fact, it makes up a far larger part of the decorative scheme of the Germans than of the French or English architects. The reader may consider in connection with this the pierced spires of Freiburg, Thann, and Cologne.

The windows which held this elaborate tracery were commonly blunter in the pointed arch which closes them than the windows of the thirteenth century. This comes of the curves of the vaults, to which we have repeatedly said these great windows closely conform. If an interior of the thirteenth century be studied, it will commonly be found that, beneath a vault whose wall-arch takes a more obtuse form, there will be opened a window with an equilateral arch, that is to say one whose centres are at the

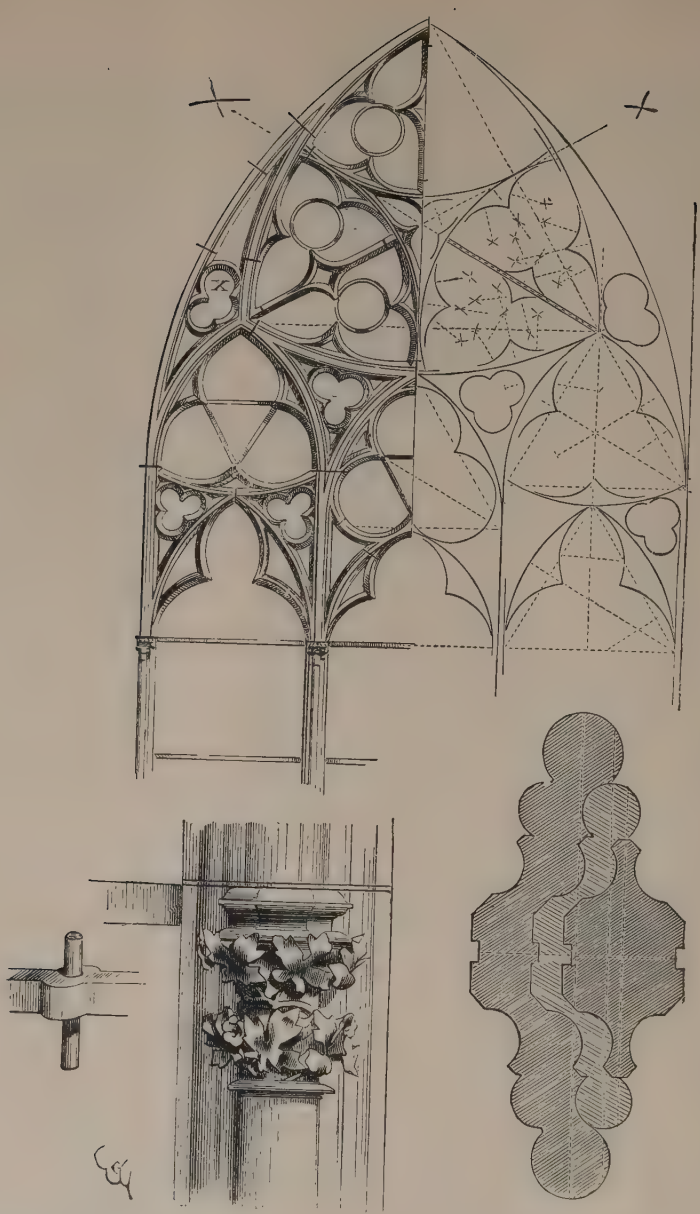


FIG. 149. Carcassonne, France: Cathedral of S. Nazaire. Window of transept. About 1250 A.D.

point of tangency of the arch-curve with the vertical line of the jamb. This peculiarity disappears of course when the window is made to occupy the whole space beneath and within the wall-arch of the vault.

The great rose-windows of the thirteenth century find few copies in the fourteenth; the great churches were built, and though here and there a rose-window may have had to be remade, such a one was commonly rebuilt again in the fifteenth century. The tracery of the rose-windows is nearly the same as that of the pointed windows, in its system of composition and in the way its mouldings pass into, and grow out of, each other. The great rose in the north transept of Rouen Cathedral is a work of the early years of the fourteenth century, and it consists of ten pointed window-heads, which radiate their arches outward, and with small triangles filling the spandrels of these arches. It is too formal, too unyielding as a design not to seem insufficient to the admirable artists who followed at a later and more peaceful time, and the change in the fifteenth century to the flowing tracery of that time is accounted for by the too mechanical accuracy of this earlier work. Immediately below this rose-window is a pierced gable rising above the great doorway; this gable is filled with tracery of which the upper part is entirely open and shows beyond it the windows and the broad gallery beneath the rose-window. Figure 150 gives the design of this gable. These pierced gables, though not altogether peculiar to the fourteenth century, are very characteristic of that time.

Of the epoch now under consideration, 1300–1420,

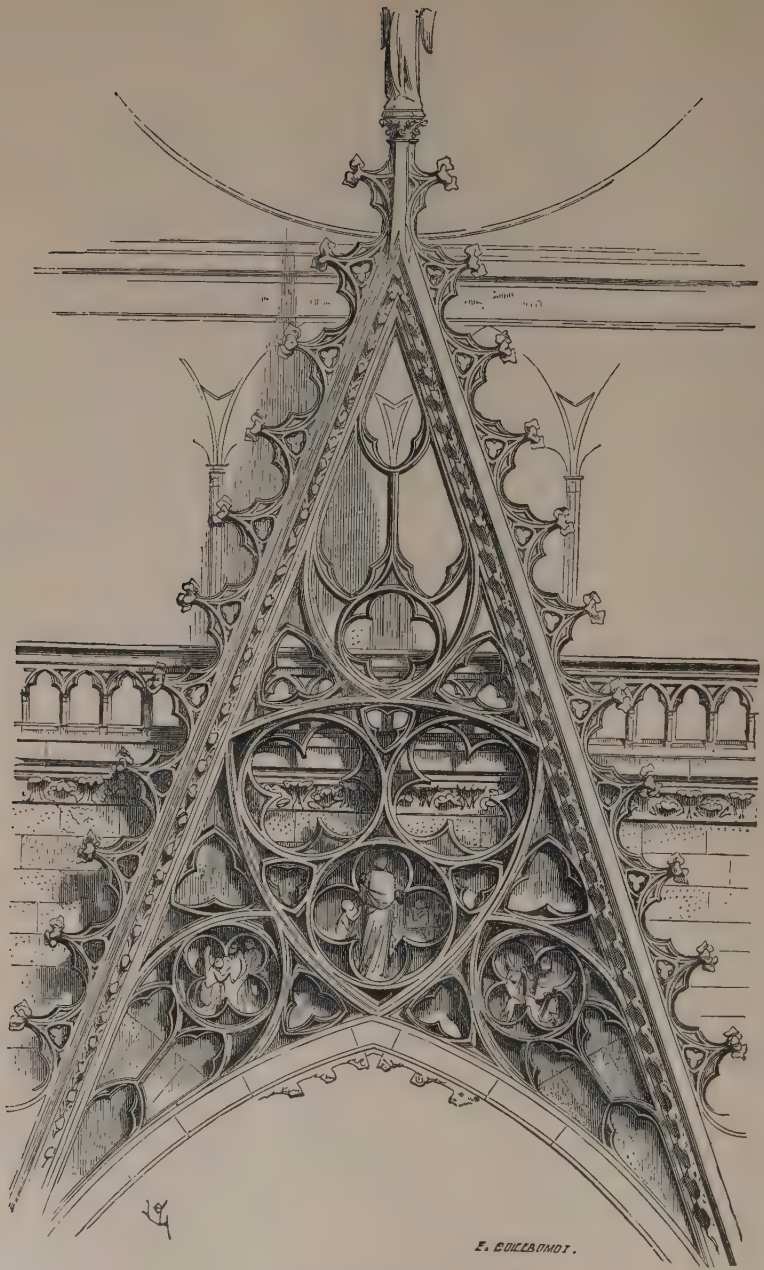


FIG. 150. Rouen, France: Cathedral. Gable over door of north transept. About 1340 A.D.

many more civic buildings exist than of the thirteenth century. During the first years of the fourteenth century, — years of prosperity under sagacious kings, — there was much building; and as churches had been built in such abundance a few years earlier, it was dwellings and halls of assembly that were now in demand. At a later time, under Charles V. (1364–80), building was continued with some vigour in the towns, and under the unhappy Charles VI. the great princes of his court vied with one another in the erection of strong castles. We have then such buildings as the splendid hospital at Tonnerre, dating from about 1305, whose great hall, fifty-eight feet wide, roofed with timber in one span, is most interesting for the comparison it makes possible with the splendid English timber roofs of the same epoch. In these latter there is an attempt to avoid the usual and obvious construction by means of a tie-beam, and to substitute an elaborate design of collar-beams and struts, using a great deal of timber, and following lines not so much constructional as decorative. Compare what is said of the roof of Westminster Hall (p. 306). In the French example a tie-beam stretches from wall to wall, and is held up in the middle by a "king-post"; the ceiling is then semi-cylindrical, and consists of wainscoting of the simplest kind with wooden ribs, within which nothing of the timber work shows except the two principal pieces named above. There is a close affiliation between this spacious room, whose architectural effect is got from size and proportion mainly, and the great interiors of Gothic churches where the volume of enclosed space is so apparently out of pro-

portion to the amount of solid material used to enclose it. A more decorative hall is the splendid one at Poitiers, the one remaining building of the palace of the old lords of Poitou. This hall is famous for its chimneys, the three great fireplaces which occupy one end of the hall, and their flues and chimney-tops, which combine strangely with the window in the gable. The greatest achievement of the time in the way of architecture, half domestic and half civic, is the palace of the popes at Avignon, a gigantic structure, with many great halls, and the lodgings for a multitude of persons, arranged in a stately way around two great courts, and enclosed within fortified walls rising high above the streets of the town and the scarped rock upon which they are built. This is at once a fortress of the first class and a stately dwelling. The palace contains a great many curious pieces of vaulting; but it is to be noticed, as was suggested in the preceding chapter, that it is no longer strictly Gothic construction when the vaults are imprisoned within the ponderous walls of a mediæval fortress. As it has been said of the castles (p. 213), and as is true of the cathedral at Albi, that the vaulting might more fittingly be vaults of Roman construction than Gothic rib-vaults, so massive are the containing walls, so it may be said of the vaulted halls in the Popes' Palace, the castle at Pierrefonds, and similar structures, that that is not Gothic construction which needs no counterpoise, but is held in place by fifteen-foot walls.

Small houses of the townspeople are not so nearly unknown for this period as for the thirteenth century, though most of them have disappeared. Figure 151 gives

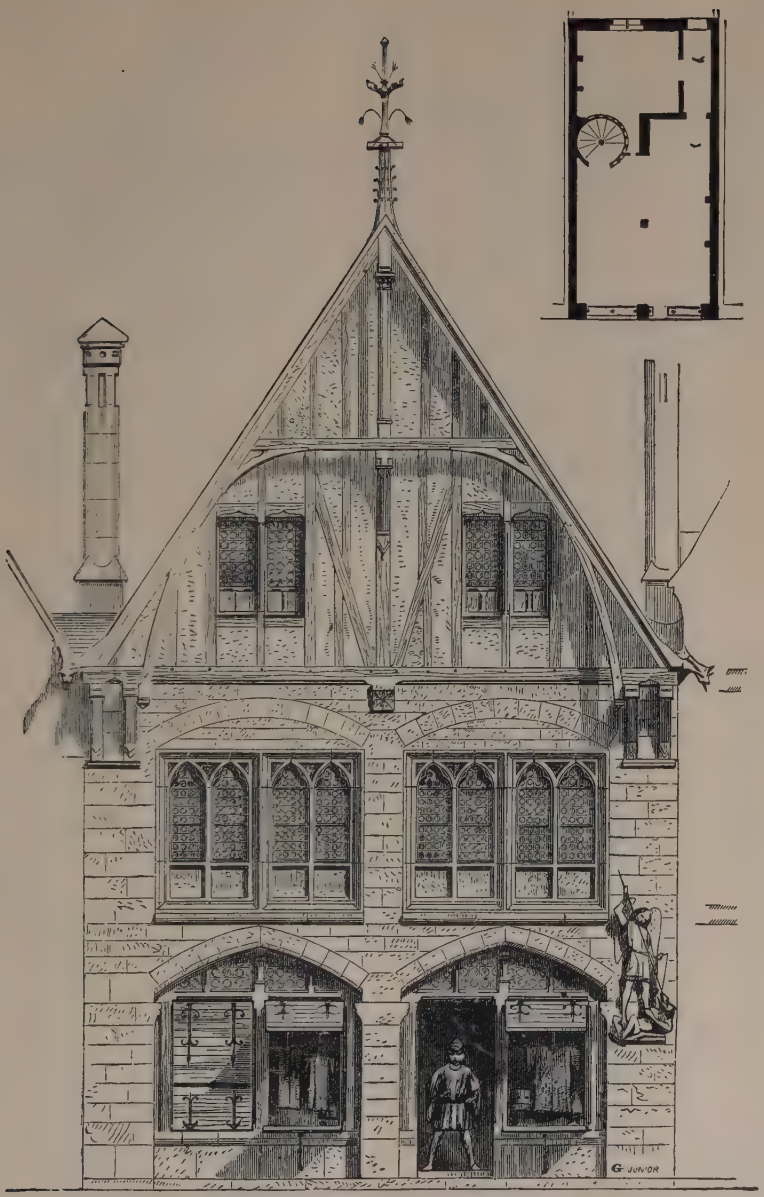


FIG. 151. Chateaudun, France: House. About 1320 A.D.

the front of one drawn by Viollet-le-Duc, in 1841, at Chateaudun, near Chartres.

Decorative timber work was extremely common throughout the northern part of what is now France; and this system of building was used in small churches and other ecclesiastical and civic buildings as well as in dwellings. One chapel remains in Troyes, much added to in later times, but still perfectly recognizable. A plan and section of it have been given by Viollet-le-Duc, and a still fuller rendering is in the *Encyclopédie d'Architecture*. Figure 152 gives a detail of its construction.

II

In Spain the fourteenth century begins with a marked advance in elaborate richness of style. One of the first buildings of importance built in this century was the choir of Gerona Cathedral with its aisles; but this is, in general style, a thirteenth-century interior. The transept of the cathedral of Barcelona was built at about the same time, and this involved the construction of the admirably simple octagon, which should be compared with the more elaborate octagon at Ely, for which see p. 303. The west front of Tarragona Cathedral was never carried above the porch, except that a fine rose-window was built and its frame of deeply recessed mouldings was left projecting from the stone wall which holds it, with the evident intention of building around it with screen-work and tracery. Each of these parts of the front, both porch and rose-window, are remarkable for the very free use of mouldings

in large groups, so arranged as to give broad belts of delicate combinations of shade and shadow. There is something English rather than French in the feeling shown here, except that the mouldings are in larger groups than the English builders generally employed.

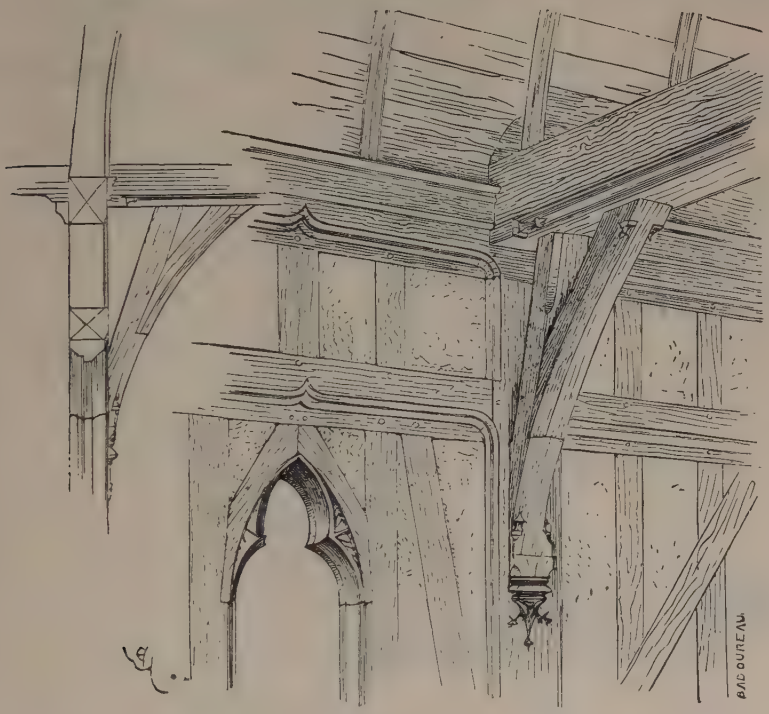


FIG. 152. Troyes, France: Chapel of S. Gilles. Detail of framing. 1360 A.D.

The most important architectural work of the epoch in Spain, at least for the purpose of our enquiry, is that connected with the cathedral of Toledo; viz., the remarkable choir with its two aisles, of which the plan is given in Fig. 153. It will be seen that the difficulty found

in vaulting the compartments of a rounding aisle (see pp. 156 and 196) is got over by alternating triangular compartments with those of rectangular shape. This had been

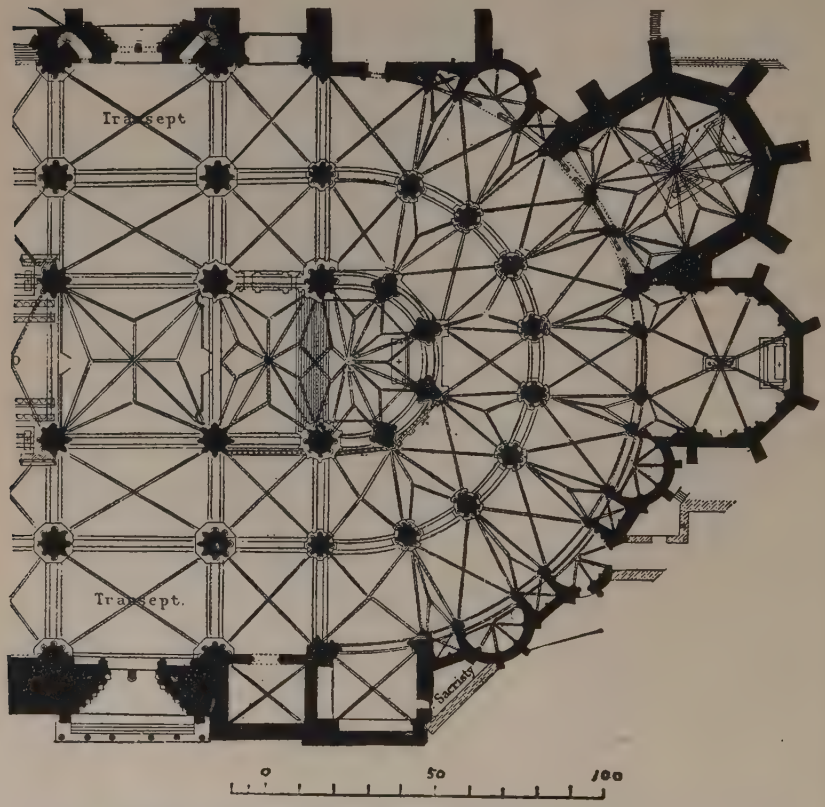


FIG. 153. Toledo, Spain: Cathedral. Choir and aisles. Beginning of fourteenth century. Plan.

tried at Le Mans at a much earlier date, and even in the rude aisle of the chapel at Aix-la-Chapelle (see Fig. 70). The effect of the interior of this great east end cannot be shown in any one illustration; Fig. 154 gives a

small portion of the outer and lower aisle which shows the alternation of square and triangular compartments. The vaulting of the great nave and the clear-story windows

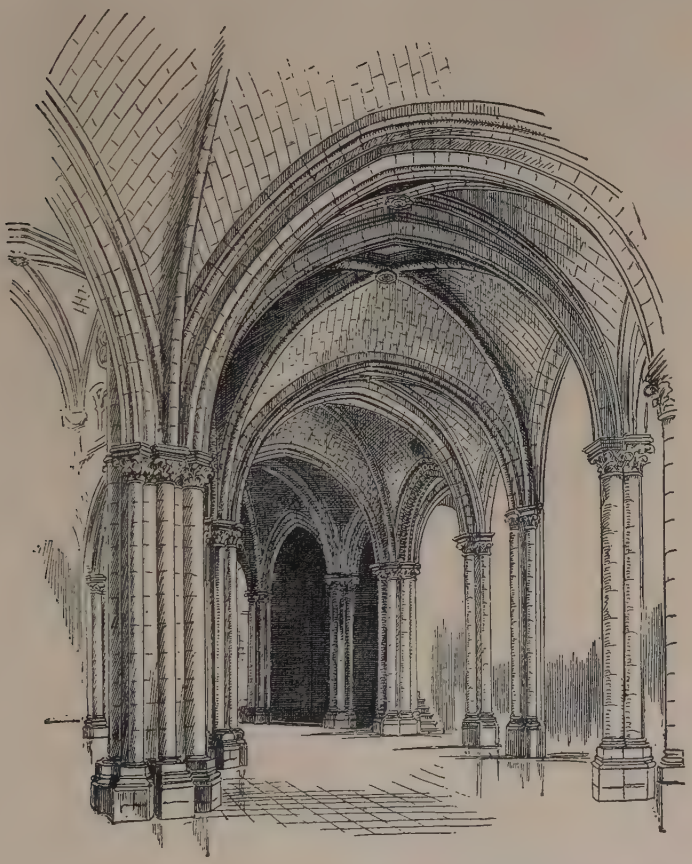


Fig. 154. Toledo, Spain: Cathedral. Outer aisle of choir. View. Compare Fig. 153.

below it are evidently of the earlier part of the century; and the remarkable screen which encloses the choir, a splendid composition of niches and canopies, most of them

having their statues still in place, are of twenty or thirty years later. The door of entrance to the north transept is probably also fourteenth-century work, as well as the extremely remarkable door leading into the cloister. In this curious composition, all the sculpture is subordinated to the architectural forms in a very unusual way, as if the designer had been afraid of interfering with the lines of his splayed jambs. Moreover, the carving on the flat surfaces is all heraldic: the lion of Leon and the castle of Castile alternating, except that the four shields on the lintel at the sides carry rampant lions only, and the central shield the quartered coat of the united kingdoms. Except for the style of the figure sculpture, such as the Madonna on the *trumeau*, and the singular group beneath her feet, representing an entombment, this is an Italian doorway. It is a problem which it would be interesting to solve, whence came the strong Italian influence not often found out of Italy at this epoch.

In two important churches at Barcelona is to be found a plan so closely allied to that of Albi (see p. 264) that the resemblance cannot be thought accidental. S. Maria del Pi has almost exactly the same plan as Albi, but with eight bays in length instead of twelve; there are no aisles, the vaulting of the nave is maintained by solid buttress-walls which divide shallow chapels, and a solid and unbroken wall surrounds the whole, except that the apse has outside buttresses. S. Maria del Mar is much larger and has aisles as well as a nave; the aisle-vaults are sustained by buttress-walls which separate chapels, and the same system is carried around the apse, so that the bounding wall

is everywhere unbroken. These Spanish towns are so near to Albi that their choosing that unusual type is not surprising. What was a need of fortification in the original became in the copies a grand uniformity of exterior design, not unpleasing to the southern spirit.

In French Flanders, the cathedral of Tournai, whose splendid Romanesque nave and towers have been described above (p. 177), has a beautiful fourteenth-century choir. Boldness of construction was carried to an extreme in this choir, for it is on record that the pillars had to be strengthened after the completion of the vaults. In its present condition it is a masterpiece of delicacy and grace. The nave of S. Sauveur of Bruges and the nave of the cathedral at Brussels are of this epoch, but hardly vie with the choir of Tournai in beauty. The village of Vilvorde, near Brussels, has a characteristic parish church of which the plan is given in Fig. 155. The section through the nave and aisles (Fig. 156) shows that there is no attempt to get light through clear-story windows: the short nave is lighted from the west end and the transepts. The choir, having no aisles, is treated inside and out nearly as the Sainte Chapelle at Paris is treated if the upper chapel alone is considered. The largest, and in that sense the most important church of the time, is Antwerp Cathedral.

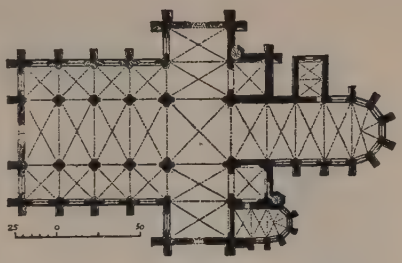


FIG. 155. Vilvorde, Belgium: Church. Fourteenth century. Plan.

This has three aisles on either side of the nave; and, as the church is singularly unencumbered by screens and enclosures, it affords one of the largest unbroken interiors in Europe. Its extreme length is not unexampled — about

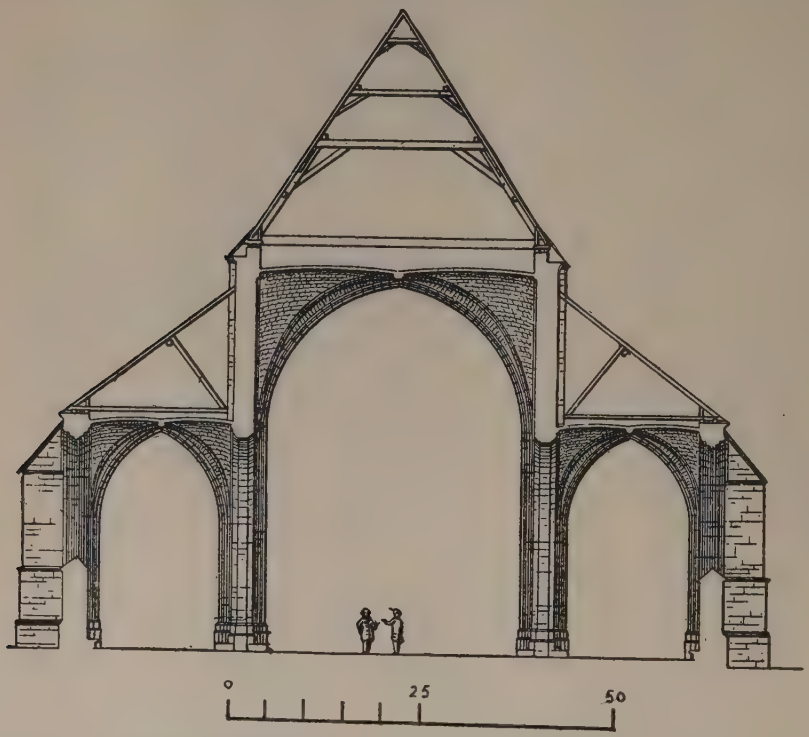


FIG. 156. Vilvorde, Belgium: Church. Section across nave and aisles (see FIG. 155).

325 feet; but its width of 160 feet seems enormous, in spite of the six rows of slender piers which support the vaulted ceiling. The architectural design of this great interior is not attractive. The vaulting, indeed, is simple and constructional: but the pillars without capitals and the large wall-spaces with their formal panelling are cold in

effect. Figure 157 partly shows the curious arrangement of the external roofing. The clear-story windows are left unobstructed and are made enormously large, and to allow of this the aisle-roofs are built with a double pitch, so that the whole clear-story wall is left free. This peculiarity is found in several Flemish churches, but in Antwerp Cathe-

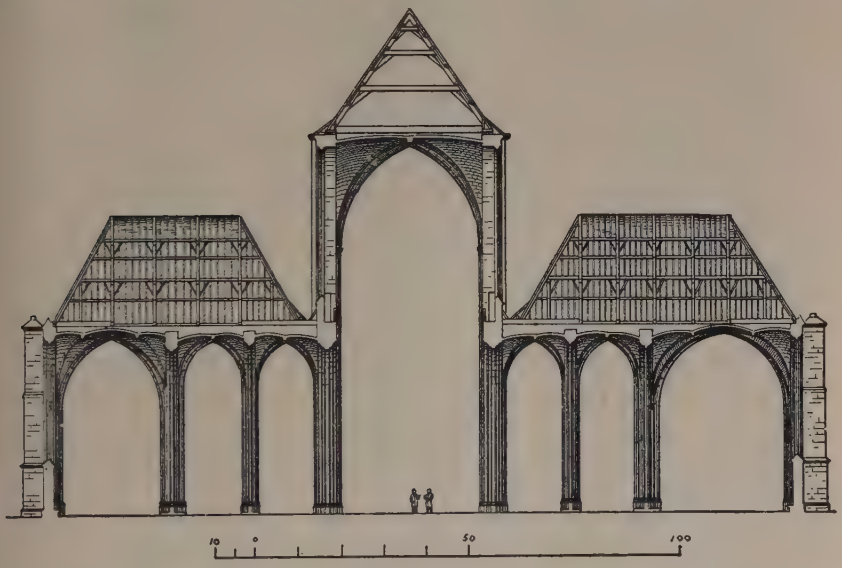


Fig. 157. Antwerp, Belgium: Cathedral. About 1360 to 1380 A.D. Section across nave and aisles.

dral alone it is carried farther, the aisle-roof being divided into detached hipped roofs, one to each bay. In the choir the same result is obtained by means of a flat masonry floor which covers the vaulting of aisles and chapels. The church of Notre Dame de la Chapelle and Notre Dame des Victoires, in the same city, have aisle-roofs hipped in one frame.

III

The church of S. Katherine at Oppenheim near Mayence contains within itself a characteristic specimen of German Gothic of the fourteenth century. The flying buttress is not introduced on the north side of the choir, where a great roof covers nave and aisle alike, but on the south side of the choir the construction includes the use of flying buttresses of considerable span. The bays of this part of the church are of great width; and, as neither the aisle nor the clear-story is very high, some very curious results are visible in each. In the aisle the enormous windows, seven lights wide and rather sharp in the arch for the epoch, are reduced to a vertical impost of less than one-third the total height of the window. In the clear-story, on the other hand, the windows are narrowed to four lights, with the result that a large amount of wall surface is built on both sides of these windows, and that this in turn is disguised and hidden, as it were, behind a buttress of enormous width. To make these clear-story windows still higher and sharper in effect, very steep ornamental gables have been built on their archivolts, which archivolts are therefore of necessity very broad, projecting far beyond the wall, and having huge hood-mouldings ornamented with Gothic foliage as if for a church porch. Figure 158 gives three bays of the south flank of the choir. The reader should notice the extreme clumsiness of the linear design; it seems as if all the charm of the fourteenth-century tracery were deliberately ignored. Still more formal, but with apparently more

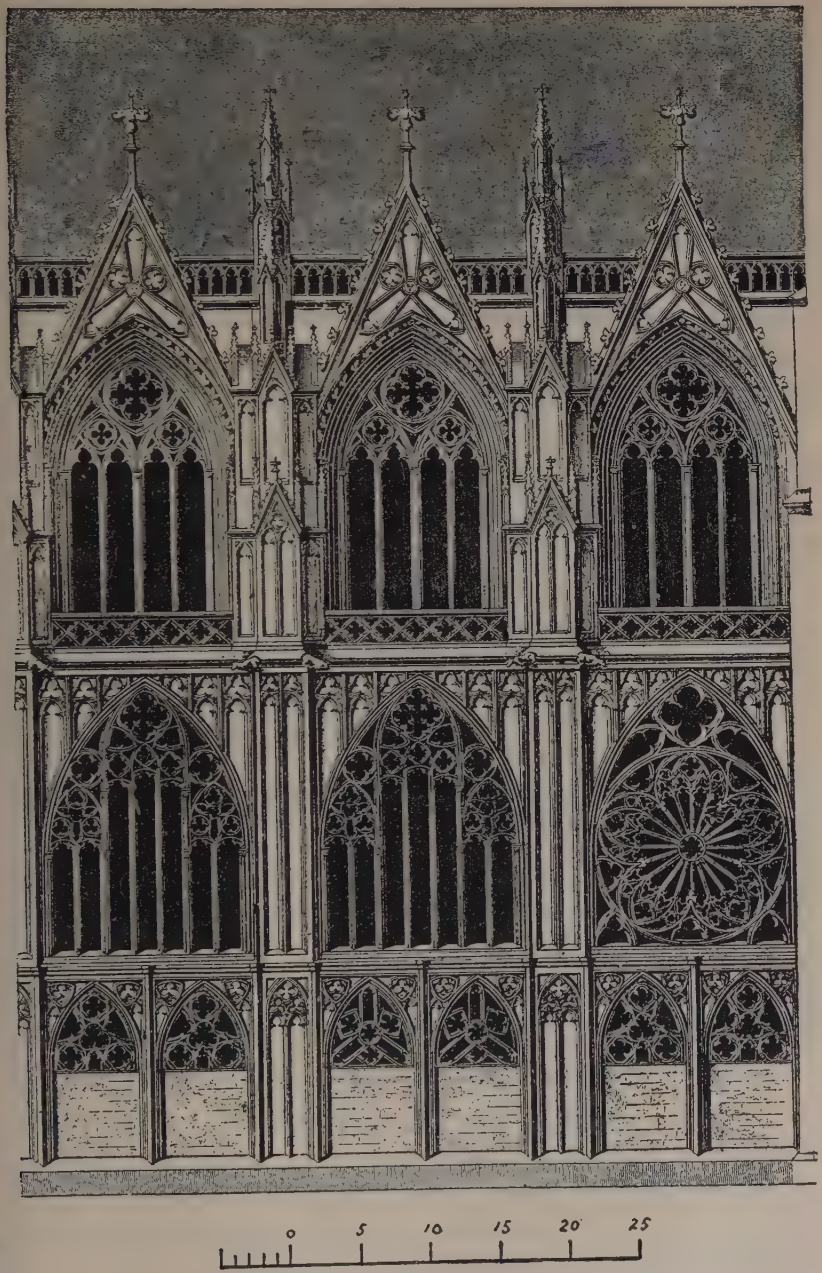


Fig. 158. Oppenheim, Germany: Church of S. Katherine, part of south flank of nave. First half of fourteenth century.

meaning in the design, is the tracery which forms the great rose-window of S. Lorenz of Nuremberg. This window is surrounded by a carved border nearly as wide as the diameter of the opening and imitating a series of canopies as if of niches for statues, a fantastic and unpleasing addition to the window which must pass for one more attempt at a novel treatment of Gothic forms, most of which attempts were destined to failure. The interior of S. Lorenz is unusual in another way; all the space above the nave-arches up to the very sills of the clear-story windows is a smooth stone wall, giving perhaps the plainest Gothic interior known. A curious feature of this interior is the round moulded capital which is so common in England, and which is generally considered as an English peculiarity. Another church in Nuremberg, also of the fourteenth century, is the Church of Our Lady (Frauenkirche). It is a small church without aisles, with tall windows with sharp-pointed arches and simple tracery. The curious stepped gable of the west front is evidently later and replaces in part a tower, which seems to have existed where now is the late Gothic porch. The most important Gothic church in Nuremberg, and perhaps the best interior of characteristic German Gothic that exists, is the eastern choir of the church of S. Sebaldus (see Fig. 159). This church has a west end and towers of an earlier date; the eastern choir is a three-aisled structure, with aisles and nave of equal height and nearly equal breadth. The high slender pillars have no capitals, and the ribs of the vaulting spring from the same level, so that the vaulting of the

aisles is slightly more acute than that of the nave. High windows are arranged between the buttresses; and this

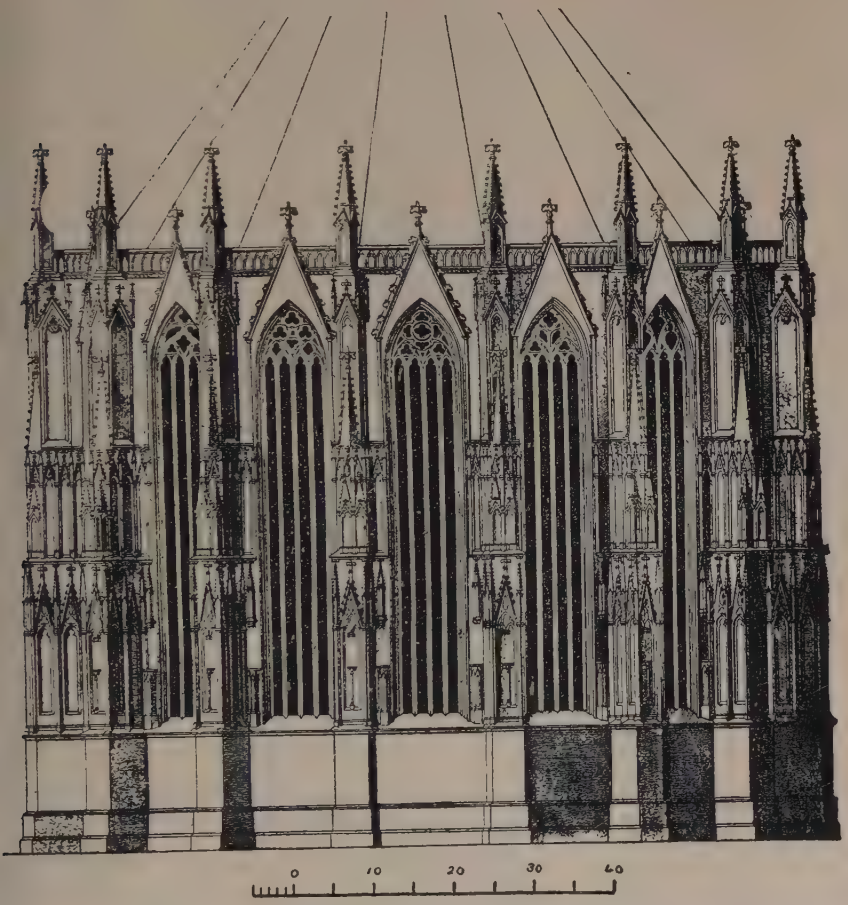


FIG. 159. Nuremberg, Germany: Church of S. Sebaldus. East end. About 1375 A.D.

splendid hall with a continuous ceiling, supported by slender pillars and with very lofty windows, should be compared with the cathedral at Carcassonne (see above,

pp. 264–5). The essential difference between them is that the windows of the German church are narrow, occupying less than half the space between the buttresses, so that there is on either side a piece of flat wall between the window-jamb and the buttress. Such pieces of flat wall are not allowed for in the original ecclesiastical Gothic, — that of France: they are not a part of the style; and accordingly the builders of S. Sebaldus' church have felt that they needed to be adorned with canopies and arcading. It is a beautiful room both inside and out, but it offers one more instance of the singular reluctance shown throughout eastern and central Germany to adopt Gothic architecture as it developed itself in France, and as it was readily taken over by England and Spain and sometimes by the Rhine towns. At Erfurt, the nave and the aisles of the cathedral form a similar hall; nave and aisles of the same height, and presenting the very curious disposition that the nave is the narrowest of the three. Here the windows are even smaller in proportion to the wall-space than in the Nuremberg church, and the buttresses also smaller. In fact, for the very great span of the aisle-vaults the buttresses appear to be very insufficient (see Fig. 160), and it would appear that the wall adjoining the buttress was relied upon to assist them. It is a curiously unskilful, ill-considered piece of construction; the church is very dark, and one longs to be allowed to build sufficient buttresses and then to knock away the wall between them and attain the result so easily and naturally reached at Carcassonne. The choir of

Erfurt, on the other hand, is a charming design, a simple room without aisles, and with a bold and skilfully designed vault worthy to rank with the Sainte Chapelle at Paris. This choir is the lofty and slender building rising from a huge vaulted substructure so attractive to travellers and so prominent in all the views of the town (see Fig. 161). Its external effect is much aided by the singular structure which is interposed between

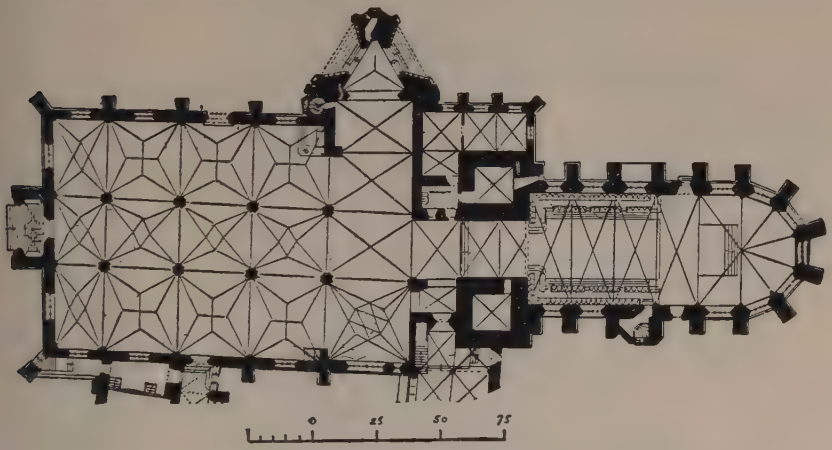


FIG. 160. Erfurt, Germany: Cathedral. Plan. Choir 1350 to 1355 A.D. Nave much later. Choir and nave have different axes.

the choir and the nave, an oblong mass of building which when clear of the roofs resolves itself into three octagonal steeples, the highest in the middle.

S. Stephens, in Vienna, is a really interesting experiment; an attempt at modifying the Gothic type which, if it did not result in a distinct eastern European style with its own peculiar characteristics, is so important in itself that it should be minutely studied. Figure 162 gives the

plan of this church, which is of the second half of the fourteenth century. The nave, about forty feet from centre to

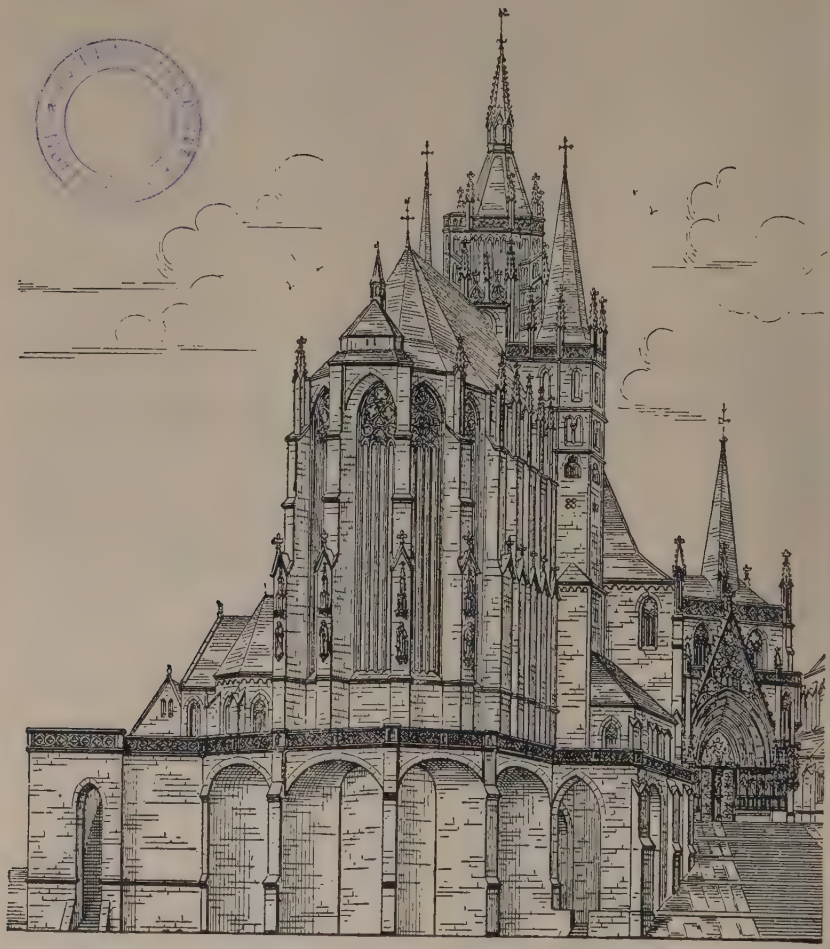


FIG. 161. Erfurt, Germany: Cathedral. View of choir (see FIG. 160).

centre of piers, is flanked by aisles of nearly its own width and also of nearly its own height; for while the nave is

ninety feet high, the aisles are sixty-eight feet. With this small difference of height there is of course no attempt at a clear-story, and the nave-roof is not lighted directly except from the west end. S. Stephens is then a hall with columns, like the cathedrals at Carcassonne and at Erfurt, and the church of S. Sebaldus at Nuremberg; but having

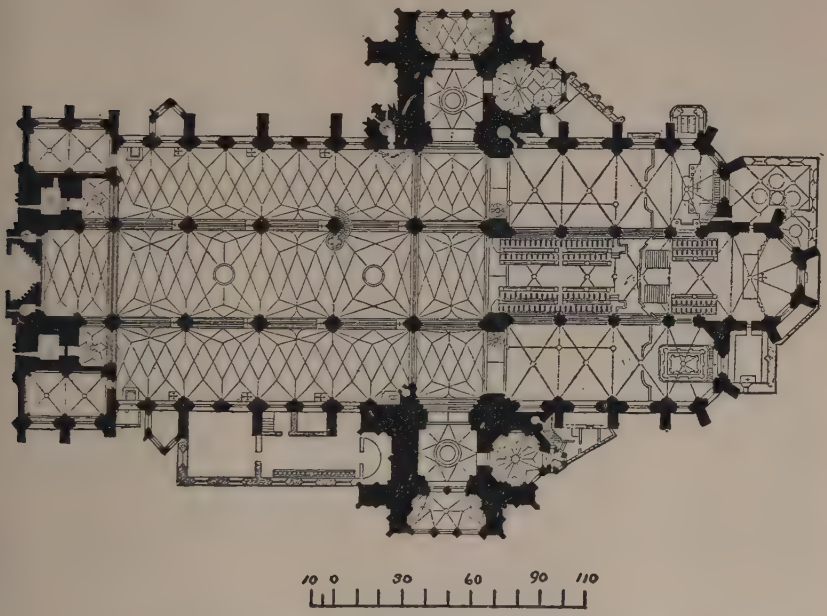


FIG. 162. Vienna, Austria: Cathedral of S. Stephen. Plan. The general arrangement is of the second half of the fourteenth century.

the central division crowned up as it were just enough to tell, when seen from below, as a slight elevation for the sake of dignity and to defeat the natural tendency of such a roof to seem lowest in the middle. The interior is very impressive, but not in the usual sense of a great Gothic church, long, high, and comparatively narrow. It is curi-

ous that the entrances most commonly used are in the north and south flank. Entering by one of these, one has no sense of crossing the aisle to reach the nave: it is all a high and spacious hall of assembly, with only six or eight lofty pillars to break it. In like manner, the arrangement of windows, two to each bay, and therefore each one comparatively narrow and high, with their pointed arches occupying but little of their vertical height, helps the effect of a square flat-roofed hall uniformly lighted on each side from end to end. This nave is one of the best attempts that were ever made to build in the Gothic style without being simply Gothic. It is rare that experiments of the sort are so successful.

The beautiful church which serves as the cathedral of Ulm, with its octagonal belfries and spires flanking a lofty apse and its unfinished western tower, must be taken as a fourteenth-century church, although not finished as we now see it until a somewhat later time. In this the German love for tracery takes the form of a study in vertical parts, large surfaces of the lower wall and its huge buttresses being divided up into high and narrow panels by slender mullions which form simple or elaborate tracery at the tops of the panels, as if a window were in question. Much of this tracery is indeed brought out so far from the wall of the tower — the enormous buttresses allowing of this — that it amounts to window tracery: the bars of windows through which are seen the wall of the tower with the windows which it encloses. The buttresses of the north and south flanks of the church are decorated also with panel work divided by narrow and deep groups of mouldings.

The west front of the cathedral of Strasburg is the culmination of this system of decoration by means of slender mullion-bars forming a semblance of window tracery. This building seems to have been finished as far as the platform, about 216 feet above the pavement of the square, in 1365. The whole of this west front is carried up to this uniform height by the insertion of a square tower-like structure between the north and south towers and resting upon the porch, the massive piers of which are carried up in connection with the towers themselves, so as to support this unusual third member of the western façade. In this way a platform nearly fifty feet wide and one hundred and forty feet long is provided at the considerable height above mentioned, and upon this stands the spire of the north tower, not finished till 1440, and at the southern end a small house covering the landing from the stairs below; for this platform is a favourite place of resort. Nearly the whole of the great west front and the north and south flanks of the towers are masked by screens of slender mullions carrying tracery and canopies. These screens included between the buttresses, which are narrow and are themselves decorated with similar screen work and with vertical panelling, give this part of the church the appearance of being enclosed in a cage. It is only between the towers, where the forty-foot rose-window is opened above the central porch, that this effect of bars of a cage ceases. Above the rose-window is a long arcade with statues, and above that, two simple fourteenth-century windows pierced in the middle tower of which we have spoken, so that the real

towers of the front are distinguished from the mass between them by this very cage of tracery. This is the more noticeable because it was the designer's purpose evidently that his two towers should carry very lofty spires, not exactly of the same design as the one erected, but even heavier in mass (see p. 354) than the present one. It was therefore not his wish to take away from the lower parts of his towers the appearance of great solidity; and strangely enough he was able to retain that appearance of great solidity in spite of the tracery which seems to disguise and conceal the massive walls behind. The church is rightly criticised as insufficient in length and importance for this prodigious frontispiece, but the westernmost structure in itself is of extraordinary interest and of a kind of defiant beauty, most valuable as a contrast to the regulated and orderly charm of the structures built under dominant French influence.

IV

In England the fourteenth century was a splendid time for architecture. The wars that desolated the continent had but seldom an echo north of the Channel, and except during the years following the appearance of the Black Death, 1349, the country was peaceful. Even the change of dynasty of 1399 caused but a slight interruption. The building of the cathedrals was carried on in the leisurely way in which it had begun in the thirteenth century. What is called the English Decorated style reaches its full development during the first years of the century.

The celebrated and beautiful central tower of Lincoln Cathedral (Fig. 163) is of 1310; it is square and is carried up directly from the interior, its walls resting upon the great arches at the crossing of the nave and the western transept. A characteristic of the epoch is the rapid increase in the number and size of traceried windows; that is to say, of large windows divided into three, four, five, or more "lights," as they are called, or subdivisions. The mullions separating these lights form the ornamental tracery in the window head. The examples given in the previous section (Figs. 146 to 149) illustrate these windows with geometrical tracery; that shown in Fig. 147 having the closest resemblance to the English windows now under consideration. There is, however, one peculiarity which causes a great difference in appearance between the French and the English examples. The English mullions and tracery bars are much broader, and are less deep in the direction of the thickness of the walls than the French examples. Thus the great English windows of about 1300, such as that

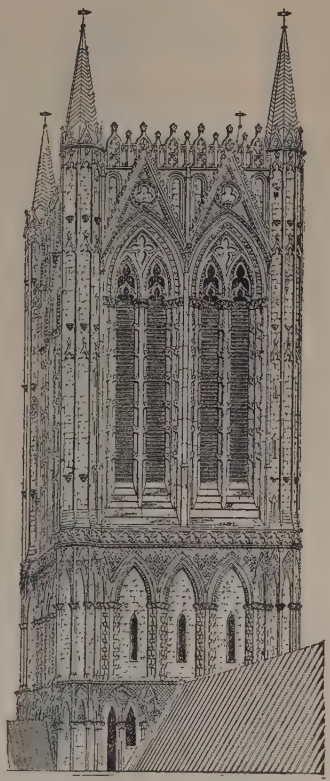


FIG. 163. Lincoln, England: Cathedral. Central tower. 1310 A.D.

of Bloxham, Oxfordshire, and the clear-story of the nave of Lincoln Cathedral, are seen to be closely allied, by the breadth of their stone dividing-bars, to those English windows of an earlier period which were rather groups of separate openings than large openings subdivided. There are, however, many exceptions to this general rule. The great west window of Lichfield Cathedral, though not continental in design, has deep and narrow tracery bars, and the splendid east window of Lincoln, eight lights wide, and exquisitely organized with its parts all duly subordinated, is one of the many details in which this cathedral approaches the more systematic Gothic of the French Royal Domain. With 1320 also begins what the English writers have called Flowing Tracery, such as that of the nave windows of Beverley Minster (Fig. 164), and in the adoption of these wavy and flame-like forms, the English architects were certainly in advance of those of the continent (see above, p. 273). Indeed, if the dates given to some of the Flowing Tracery windows be correct, these windows precede by nearly a century the flamboyant tracery, which alone can be compared with them. Flowing Tracery reaches perhaps its culmination in the great and beautiful east window of Carlisle Cathedral, nearly twenty-seven feet wide and divided into nine lights. Figure 164 *A* gives this splendid window, which, however, finds a worthy rival in the west window of York Minster, known to have been completed and glazed in 1338.

It is curious to note how suddenly the waving forms of this graceful English invention are deserted for another and equally original English style, the Perpendicular Trac-

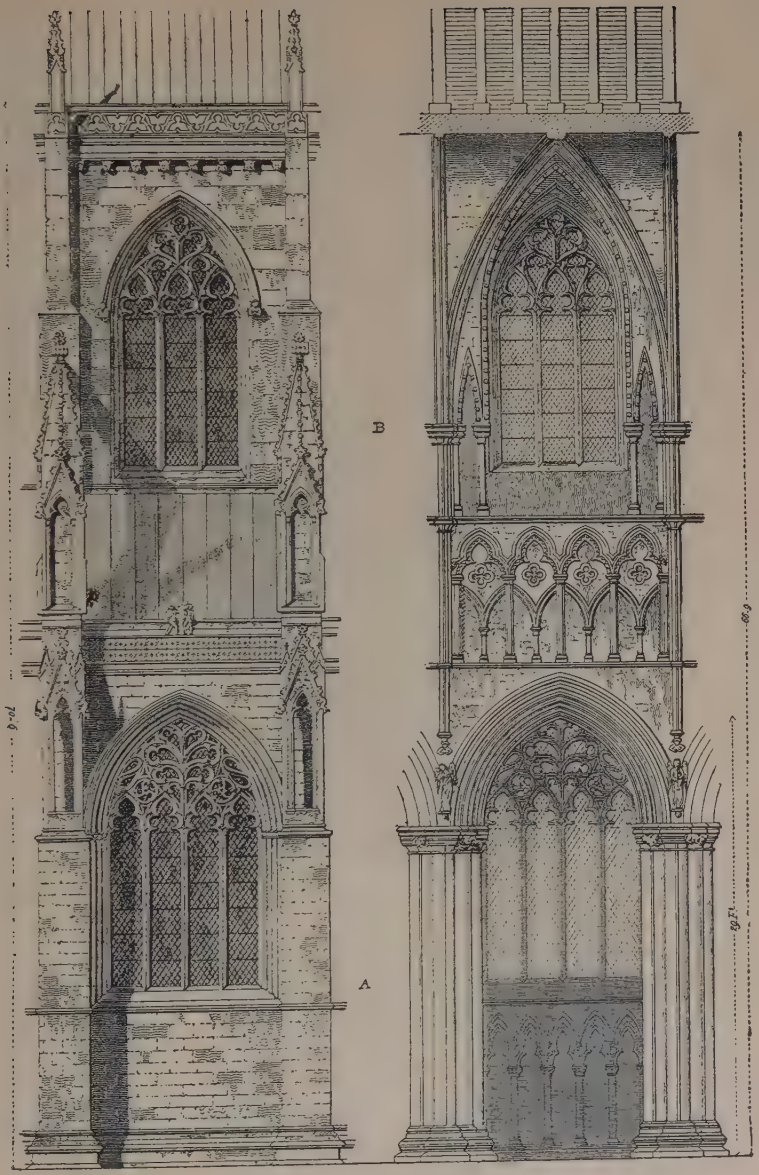


FIG. 164. Beverley, England: the Minster. One bay of the nave. About 1330 A.D.

ery, which begins as early as 1360 (see Figs. 165, 189, and 189 A). The great east window of Gloucester was probably built at the same time with the choir or immediately afterward, and this choir is known to have been finished about 1350. In this instance the window fills the whole space beneath and within the vault, but as it is curiously adapted to a slightly polygonal east end, it may be con-

FIG. 164 A. Carlisle, England: Cathedral. East window. About 1300 A.D.

sidered wholly exceptional. The famous west window of the nave of Winchester Cathedral is known to have been built before 1366, and here the traceried window fills the whole space within the constructional piers and the vault which they carry, and does so in a perfectly normal way, there being only a slight blunting of the window arch, which leaves a scrap of wall above it and below the vault. This is one of the many reasons for the statement often

made that the Perpendicular is the first thoroughly organized English Gothic style. Its characteristics are the low-pitched, almost flat roof; the great size of the windows, which fill the whole or nearly the whole space between the constructional uprights; the generally complete organization of the vaulting system, with vaulting shafts carried up from the foundation; the more fully developed flying buttresses, with wall-strips, against which they abut; and the typical, purely English, square tower, crowned with an open parapet and with four or eight pinnacles, but without spire or visible roof of any kind. Other peculiarities are less universal, but very characteristic, such as the steep slope of the flying buttresses, as in Bristol Cathedral, the choir of Norwich Cathedral and Bath abbey church, and the continual employment of battlements and pinnacles breaking the sky-line where there is no visible roof. Churches of a simple kind and of this style are very numerous. The choir of Staindrop Church, Durham County (Fig. 165), shows Perpendicular windows of good style, those of the north flank being of about 1370, and that of the east end of the fifteenth century. The Perpendicular style was long-lived. It knew how to accept and assimilate most varied forms and the richest and most diversified architectural details. Its history is therefore continuous, and shows a natural development, from 1350 to the beginning of what we call the Elizabethan style, as will be seen in Chapter VII.

In the matter of vaulting, the English churches grow continually more interesting as time goes on. The ribs, which we found in Chapter V. to be put in often without

regard to construction, and for decorative purposes alone, are now found to be more significant. It is not indeed possible to say that they are all necessary, but at least it appears that a skeleton of ribs was built with a view to the ultimate effectiveness of the structure. The simplicity of the original Gothic vault is deliberately aban-

FIG. 165. Staindrop, England: Church. Choir about 1370 A.D., except end window, which is later.

doned, but in the place of it a rich and highly architectural result is obtained. When such a decorative building as the nave of Canterbury is under consideration, it seems

absurd to complain of it for not resembling the simpler work of earlier times. The nave of Winchester Cathedral is as fine as that of Canterbury, and deserves the most careful study.

In a few instances an entirely novel attempt is made. The Gothic builders undertook that which had not been tried before. The most important departure made is the case of the regular octagon of Ely. Here at the crossing of the nave and transept an attempt was made about 1325 to make a dome-like structure conterminous with the whole great square within, not the clear-story walls, but the aisle-walls; that is to say, to build an octagonal hall as wide as the nave and aisles taken together, nearly seventy feet, the nave, transept, and choir to open into the four opposite sides of this, and the aisles to open into it also by means of low archways in the diagonal walls. The vaulting of this octagon is based upon that convex or semi-pyramidal arrangement explained in the last chapter in connection with Lincoln Cathedral. These half-pyramids are arranged as shown in the plan (Fig. 165 A), and the ribs which form them stop at the continuous octagonal curb above from which the lantern rises. Now, as the whole weight of the

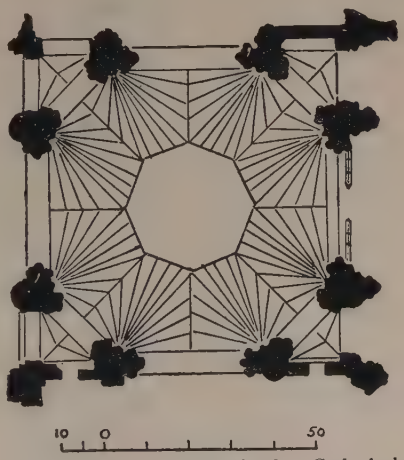


FIG. 165 A. Ely, England: Cathedral. Plan of the crossing of nave and transept. The vaulting of about 1325 A.D.

lantern rests upon this curb, it will be seen that the ribs are not acting at all as parts of an arch. The theory explained above (pp. 196–7), according to which it was half-arches which were found to be the essential of the Gothic vaulting, would seem to have been carried to the extreme in this case, except that these ribs are not doing arch-work at all, but are really struts; and the key of the whole composition is the rigid octagonal curb above alluded to. In other words, this is not masonry vaulting in the ordinary sense; but that is indifferent, and the world might have welcomed the innovation, and developed the idea farther, had the result seemed agreeable to the architectural designers of the time.[1] It is not pleasing, however. The otherwise beautiful interior is marred by the abrupt expansion in the middle, which makes the four arms of the cross too slender by comparison, and the brightly lighted octagon overhead breaks into the dusky stretches of vaulting in the harshest way. This is one of the many unsuccessful attempts at an original and unexampled system of design, and one of the most vigorous and promising of them.

Many novel experiments in vaulting were made by the

[1] The Gothic builders can hardly be thought of as studying the cupolas of the Pantheon at Rome and H. Sophia at Constantinople. Their attempts at covering an octagon, as at Ely, or a square, as at Milan (see pp. 320–21), with one system of vaults without a central pillar, are not strictly attempts at cupola construction. Such as they are, they seem not to have satisfied the workmen of the time, for none of them were followed up. The two experiments named above, that at York in the beautiful chapter-house, and that at Prague, the Karlshofer Kirche, are all interesting, but not one of them had any important results. Of these, the Prague example is the most remarkable, — over seventy-five feet from side to side; that of Ely is about seventy-two feet from side to side, while the other two are much smaller.

English church-builders of the fourteenth century. One of these, from the "Chapel of Nine Altars" in Durham Cathedral, is given in Fig. 166. It is curious to see, in

Fig. 166. Durham, England: Cathedral. Chapel of the Nine Altars. Detail of the vaulting, north end.

work of so late a date, the retention of the very broad vaulting rib with its hollow mouldings filled with sculptured leafage. A very similar system has been followed in the choir-vaulting of the same beautiful church.

The year 1395 saw the beginning of Westminster Hall, one of the most important and interesting buildings in Europe, not wholly ecclesiastical in character. It was finished, with its noble timber roof, before the close of the century. Figure 166 A gives half of one bay of this roof, which has sixty-eight feet of clear width between the walls, and rises forty-six feet above them to its ridge. The walls of Westminster Hall are very massive, and pierced with windows which are small for its extent. The building is therefore not more closely related to true Gothic construction than are the buildings of residence or of defence erected at this time. It is as perfect an example as exists of such exceptional structures as accompany a great architectural movement but do not form a part of it. What it takes out of the Gothic system is its high and steep roof, its peculiar architectural decoration made up

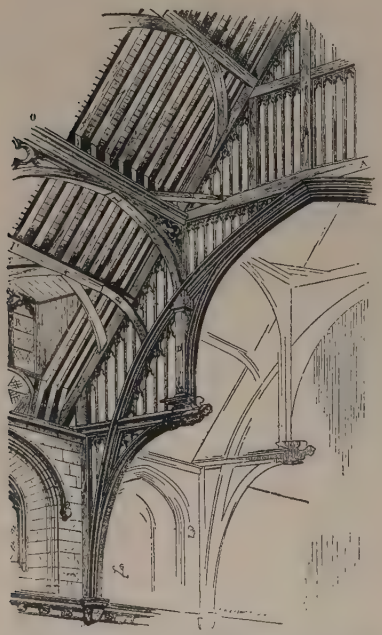


FIG. 166 A. London, England: Westminster Hall. Part of the roof seen from within. About 1398 A.D. *O*, principal horizontal piece which bears upon the vertical posts *D*, and which carries the rafters about half-way between the wall-plate and the ridge. The vertical posts *D* rest upon the hammer-beams, the ends of which are carved into figures of angels. *A*, collar-beam, which is a horizontal tie. *I*, *I'*, secondary horizontal pieces or purlines. *L*, *N*, *P*, diagonal braces. *R*, dormer window.

of the pointed arch with cusps, its peculiar sculpture, though this is sparingly used, and most of all, its reliance upon the actual construction and the constructional putting together of the parts as a chief means of effect.

V

At the beginning of the fourteenth century two very large churches were in progress in Italy, — the cathedral of Florence and S. Petronio at Bologna. In the nave of each of these there is much resemblance, so far as the interior disposition goes, to S. Maria Novella at Florence, described in the last chapter. The same very high pillars widely spaced, so that the nave is vaulted in squares and so that the nave arches rise high toward the roof, reducing the clear-story to a mere series of lunettes; the same lofty aisles corresponding to the nave-arches; the same absence of any system of vaulting shafts, the nave-pillars being indeed composed of clustered piers, but having no exact relation to the vaulted ribs which they carry, — all these peculiarities are seen here as in the smaller church. Figure 166 B gives a portion of the plan of each of these two great churches, with which is shown a part of the plan of Amiens. The two Italian churches are very similar except for the chapels which accompany the aisles at S. Petronio. An inevitable result of the vaulting of the nave in squares, instead of parallelograms with their length across the nave, is that at Florence there are but four bays in the length of the nave and at Bologna only six, although

the latter nave has the unusual length of 350 feet. The result of this, again, is the inevitable loss of much of the charm of the northern Gothic churches. The apparent length is diminished to a surprising and inexplicable extent by the great size and small number of the bays. Figure 167 shows the interior of S. Petronio; the fact that

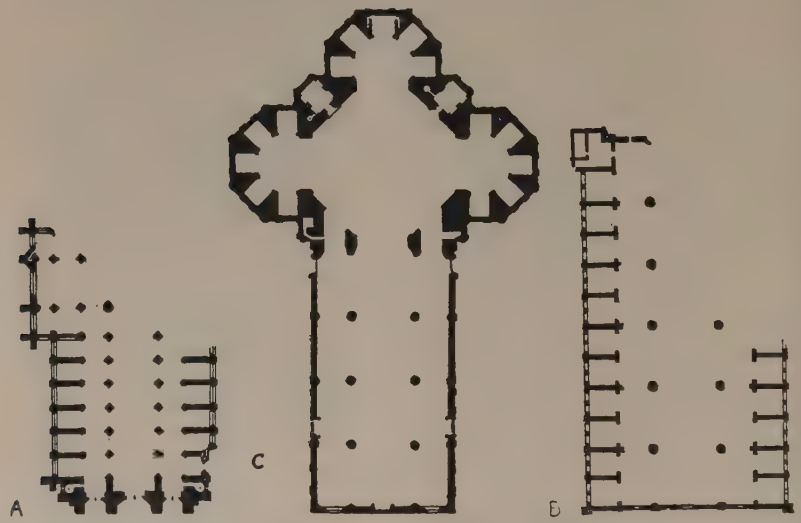


FIG. 166 B. Plans, to the same scale, of S. Petronio, B, Bologna, and Cathedral of Florence, C, compared with that of Cathedral of Amiens, A.

the springing line of the nave-arches at the top of the great capitals is over fifty feet from the floor, and the spring of the nave-vaults more than one hundred feet from the floor, is not important to our inquiry, because those dimensions do not greatly exceed the dimensions of such cathedrals as Amiens, Bourges, or Cologne. What is important is the absence of subdivision into numerous minor parts, all combined in a systematic and intelligible

Fig. 167. Bologna, Italy: Church of S. Petronio. Nave. Close of fourteenth century.

way. If the interior of Noyon (Fig. 121) be compared with this, it will appear that the whole side wall of the French nave, with its lower arches open into the aisles, its gallery, triforium, and clear-story windows in the intervals of the vaulting, is replaced in the Italian example by nave-arches of just three times the span of the French ones and by the same blank, bare, unorganized wall above them which we found in S. Maria Novella (Fig. 140). Mere size has been of little avail in giving dignity to this great interior. With smaller dimensions a French Gothic cathedral would have seemed larger, and what is more to the purpose, would have produced a perfectly satisfactory artistical result, impressing the beholder at once with the sense of vastness and the sense of perfect grace and harmony; surprising him by its boldness and yet satisfying him as to its solidity. In other words, the French Gothic cathedral embodies a complete system of proportion, worked out as carefully and grasped as perfectly by the builders as the system of construction, while the Italian interior shows a style half understood and to a great extent misunderstood, and the need of years of development before it could reach perfection, — which years of development were not to be granted.

Nothing of S. Petronio was ever built except the nave with its aisles and chapels. The existing model for the completed church shows that it was to have been a Latin cross in plan, about 750 feet long over all and covered at the crossing of the transept by a gigantic dome. This last feature could hardly have succeeded in the hands of these unpractised builders, but in other ways S. Petronio has

much, even in its early and original conception, to interest the student of mediæval building. It has, for instance, large and decorative windows; windows which in themselves are very interesting pieces of Gothic designing. In these, the simple outer tracery is of brick-work carefully moulded, but very plain, while the inner and more elaborate tracery is of marble. Other windows there are which are much more elaborate, five lights instead of four in width, and with all the tracery of marble, but these are later in date and inferior in taste.

The nave of Florence Cathedral shows signs in the interior of the elaborate and patient study which marks every part of that famous building and its appendages. The designer was offended, as he might well have been, by the awkward form of the piece of wall above the nave arches in so many Italian churches (see Figs. 140, 141). To remedy this, he carried a broad band horizontally above the nave-arches, which band provides a rather successful system of abutments for the high vaults. The lunettes of the clear-story left free above this horizontal band are of good proportion, and the double spandrels below, though not at all graceful, are felt to be inevitable (see Fig. 168). That the nave is in spite of this care on the part of its designer a most uninteresting and unattractive interior is caused partly by the absence of well-considered and well-applied decoration; for it has neither the translucent colour of the North[1] nor the opaque colour of Italy, as at S. Francis of Assisi; partly by the small

[1] There is beautiful glass in the windows, but the surface is relatively small.

size and unimportant character of the windows as seen from within — for a great interior without effective windows is lost; and partly by the same faults of proportion which we have noticed in S. Petronio. The Gothic style, even in this bastard form, reaches no farther than the

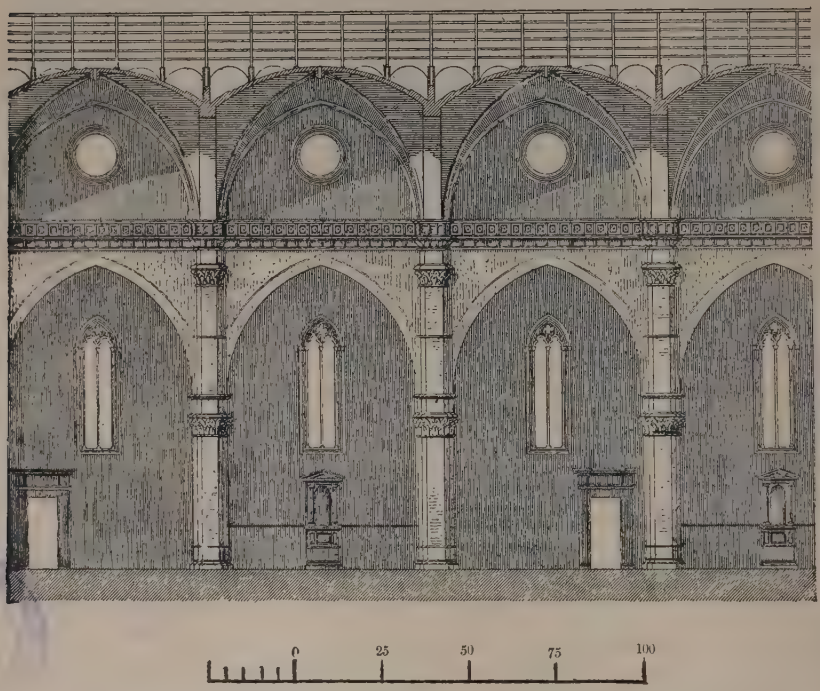


FIG. 168. Florence, Italy: Cathedral. Construction of nave. First half of fourteenth century.

nave (see Fig. 166 B). To the eastward of the nave comes the great octagon with its three apses and the chapels which surround them; a combination of structures originally Romanesque in plan, as pointed out above (page 149), and developed into a series of semi-independent

octagons and parts of octagons, each having its own cupola. It is not known exactly what the first designer had in mind for the roofs of this tri-apsal sanctuary, but it was clearly nothing in the least degree Gothic.

The tendency to avoid the pointed style and to insist upon the round-arched building as a natural development of the earlier Romanesque is well seen in a noble building of this time, the cathedral church of S. Martino at Lucca, built during the first half of the fourteenth century. Here the pillars of the nave are not unlike those of the pseudo-Gothic churches we have described, and the pilaster, which takes the place of vaulting shafts, differs from the similar features in the pointed-arched churches only in being somewhat broader and more massive. Springing from these pilasters are large and heavy transverse arches, and the vault which finds much of its support in these can hardly be called a Gothic vault (see Fig. 168 A). It is indeed doubtful whether the slightly emphasized ribs are really constructional ribs at all, and whether we have not here a revival of the early Romanesque cupola-vault, depending upon the transverse arches and the wall-arches for its support; as in the case of S. Michele at Pavia (see p. 169). There is an admirable triforium consisting of two arches in each bay, sometimes round and sometimes pointed, the great arches of the nave are semicircular, and, in fact, there is nothing to remind one of the existence of northern Gothic except the not very characteristic tracery beneath the arches of the triforium. A still more decided protest against the northern Gothic is seen in the Loggia dei Lanzi, built

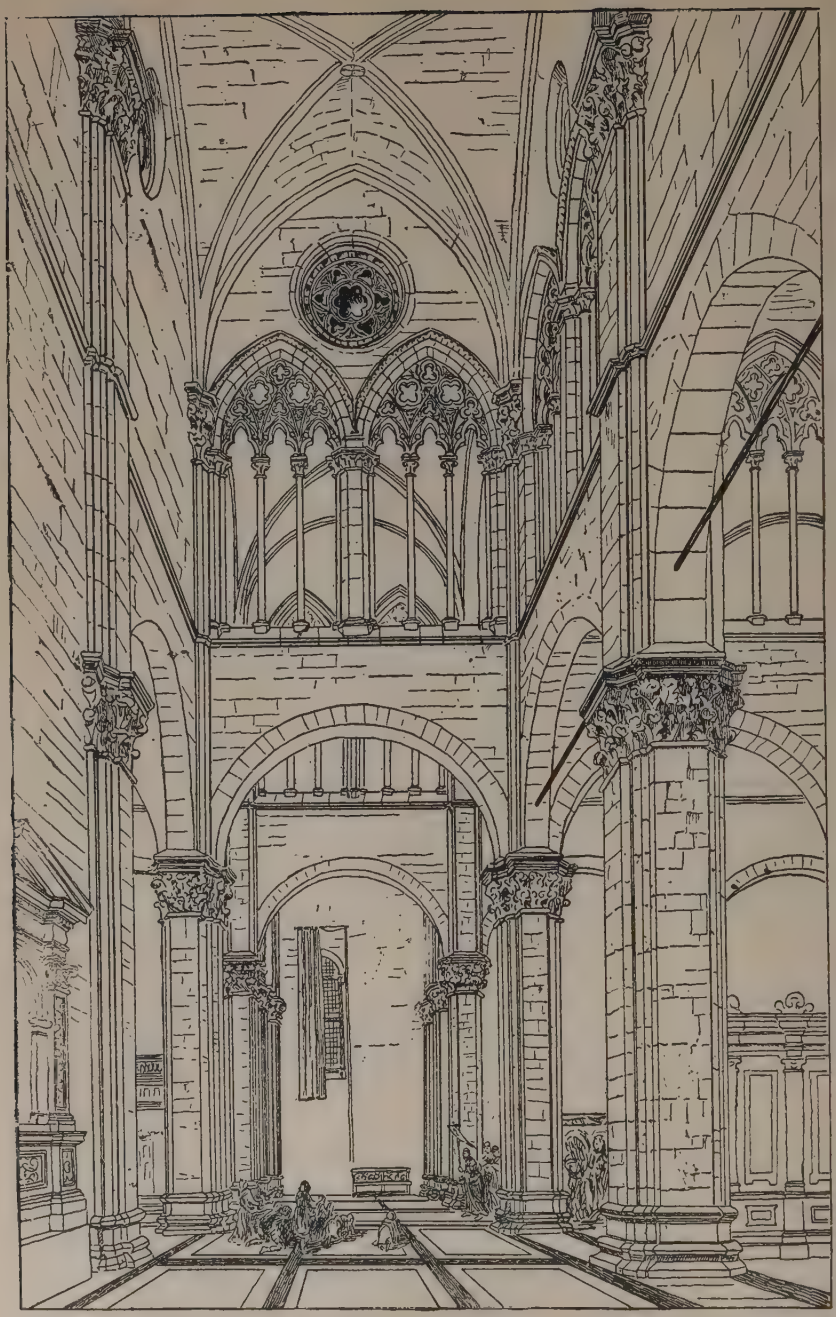


FIG. 168 A. Lucca, Italy: Cathedral as completed early in the fourteenth century.

at Florence from the designs of Orcagna about 1375. This structure (see Fig. 169) is, in plan, a parallelogram roofed in three nearly square compartments. These compartments are separated by immense and solid transverse arches, and the archivolts of the great arches of the interior and of the wall-arches are deep and show the most massive and careful construction. The vaulting ribs also are extremely massive, so that the great vaults, about forty by forty-three feet, are carried by what seems almost a superfluity of support. This, however, is only an additional expression of that non-Gothic feeling of which this building is so marked an instance.

In the Loggia dei Lanzi, as in so many other Italian buildings, iron ties are used to resist the thrust of the vaults. It cannot be said that these ties are absolutely necessary. The building is very solidly constructed and with excellent workmanship; the great piers are about six feet in thickness; the weight on the haunches of each arch is that furnished by twenty feet vertical of solid masonry, and this weight might easily have been made very much greater at the angles, where especially needed, without altering the design, by the simple process of building up to the level of the top of the parapet at those points. It is unquestionable that these ties are used in Italy when not needed. Every one who has observed Italian buildings of the middle ages will recall long arcades of which the inner arches are as elaborately stayed as the end ones, with stout iron bars. It has long ago become an admitted feature: the bars are put in on all occasions and in every place, spanning small arches and

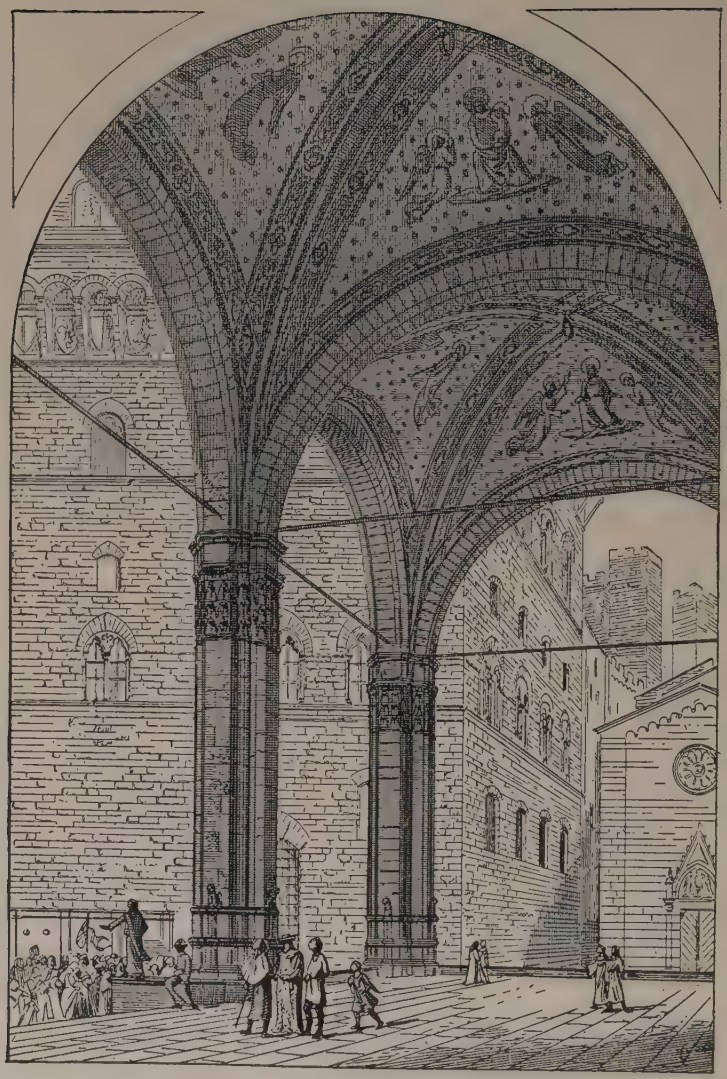


FIG. 169. Florence, Italy: Loggia dei Lanzi. About 1375 A.D.

great, and steadying alike corner pillars with vaults pressing on them in two directions, and pillars equally large receiving no thrust that is not taken up and counterbalanced. If, therefore, we assume that this building does not absolutely require the iron ties, we have a faultless structure and one which deserves, as indeed it commands, almost universal admiration. If, however, the ties are assumed to be necessary, there is still in this beautiful portico the almost complete development of an architectural style. The needs of Italian builders would have been well met by the system of vaulting, the scheme of archivolts and clustered pillars and the semi-classic sculpture of the elaborate compound capitals with leafage in three rows, which leafage surrounds each great pier with a belt of ornament, and is not so much a capital as the crowning member of a pillar too large to be treated as a column. It is in every way to be regretted that the Italians did not abandon Gothic architecture at this point, and go on to a round-arched style, which would have had undoubtedly much of the character of the building before us.

The exterior decorative architecture of the cathedral of Florence, and that of the famous bell-tower (see Plate IV.), embody another attempt to provide a new architectural style for the new conditions. It is clear that nowhere in Italy more than in Florence was there felt that longing for a style more southern in its characteristics than they found the Gothic style to be. The walls, to please the Florentines, had to be broad and smooth, and unbroken within and without. The Gothic structure, with its organization

showing in every foot of it, did not interest them at all. Small windows and few of them; the interiors treated like halls, with their different parts nearly of a height and no refined system of proportion governing the heights and widths of the different parts; doorways small and low, and opening anywhere, as convenient, forming indeed no part of the plan considered as a work of art, — all these peculiarities left the Florentines at liberty to think out something in surface ornamentation. Twelve hundred years before, the Roman imperial architects had thought out a similar problem, and had elaborated a system of surface ornament by the use of thin facings of marble, serpentine, and alabaster, and still thinner ones of glass coloured in the material or moulded in low relief. Now in the fourteenth century the Florentines invested the exteriors, first perhaps of their baptistery, next of the campanile, and finally of the cathedral itself, with a facing of coloured marble. The larger surfaces are covered with panel work not very minute or elaborate in its parts, but everywhere are horizontal bands, upright splays of window jambs, and archivolts flush with the wall or in reveal, which members are adorned with an inlay of marble so delicate in its parts and so elaborate in design as to vie with the mosaic floors of the baptistery. In grace of design and in variety of pattern these inlays surpass anything of the kind in western art. A great deal of sculpture in low relief is used in connection with this delicate inlay. These highly decorative parts are used in connection with the simple panelling of the exterior with almost infallible touch. The flanks of the cathedral of Florence, nearly devoid of general

PLATE IV. CATHEDRAL OF FLORENCE (TUSCANY) ITALY

The tower and marble sheathing of the walls are of XIV century.
View from S. E. of tower and western part of Nave.

architectural character, are treated with this marble facing in such a way and with such consummate skill that each becomes an architectural composition of a high order. It becomes evident, on comparing the south flank of Florence with that of a cathedral like Bourges, that there are two architectures left to us from the mediæval world. It appears that the architecture of construction and organization, of reason and logic, of perfect proportion and harmony of part with part, is but one, and that there is also the architecture of huge masses, hardly organized, piled up without much reference to the significance of their parts, roofs and walls thought satisfactory if they give shelter, and then adorned richly with what the arts of colour and of form can give after the construction is finished.

In Tuscany the last word of nominally Gothic art was spoken in these buildings of simple form and build, but beautiful surface ornament, with sculpture and painting. It cannot but be regretted that the style was not allowed to develop itself freely, without the violent interruption of the classical Renaissance. In the North of Italy, however, there are no such regrets to be expressed. Gothic architecture in Lombardy said its last word in the most singular building in the Peninsula, the cathedral of Milan. This building is a cruciform church, with two aisles on each side of the nave, one aisle on each side of the transept, and an aisle turning around the circular end of the choir, and producing a polygonal apse. The system of the interior is nearly like that of the churches of S. Anastasia, S. Maria Novella and S. Petronio at Bologna, in having

the clear-story wall reduced to a lunette awkwardly invaded by the arch rising from below. In one respect at least it is superior to any of those churches; the number of bays is practically doubled, so that the aisle-vaults are in square compartments, and the compartments of the nave are parallelograms of almost two squares. The awkward high-shouldered effect produced by the great height of the pillars in proportion to the arches of the nave and their superincumbent wall is indeed increased rather than diminished by this narrowing of the bays, but that which is of much greater importance, the proportions of the church taken lengthwise, are greatly improved. In another respect the interior is worthy of study. In all such large clustered piers, when it is decided to make a ring of leafage to serve as a capital of the whole pier, or in any other way to end the shaft of the pier at a uniform level, as is generally done in Italy (see S. Petronio, and the cathedrals at Florence and Lucca, Figs. 167, 168, 168 A), there is the difficulty that this crowning member is found to be inadequate. In the case of the Loggia dei Lanzi (see p. 317), this difficulty was got over by the superimposition of three decided rows of leafage. In Milan Cathedral a far more daring expedient was resorted to. Each pier is surrounded at the top by a belt of niches with statues in them. A bold leafy band is arranged at the top of the shaft; this affords a support for the statues, and the architectural details of the niches rise around the piers and invest them up to the line of the springing of the nave-arches and aisle-vaults. In the vaulting of Milan Cathedral there is one interesting feature, — the curious vault at the crossing of nave and

transept, which may be thought to approach success as a cupola more closely than any Gothic dome that exists. It is far more graceful in its lines than that which covers the octagon of Ely Cathedral (see p. 303), and in this case, although the span is smaller, the undertaking is bolder, because it is a square which has to be roofed, the roof being brought to an octagon by pendentives, and this crowned by a vault carried on eight ribs leaving between the curves of the roof eight equal lunettes.

It is the exterior of Milan which is the most peculiar and puzzling of designs, and one of the least agreeable of all important pieces of architecture. It is almost universally disliked by students of architecture of all schools, and has indeed nothing to recommend it even to popular favour but its immense size and the effect of light and shade on its buttresses and pinnacles of white marble as if upon a snowy mountain. Analysis of its design is impossible here, but it may be stated that the fault which seems to pervade it is an absolute lack of fine proportion. The façade or west front is the worst part, and will probably be still less agreeable when the classical window- and door-pieces, work of the sixteenth century, are taken out as proposed. The best part is perhaps the tower which crowns the cupola above described, and with curious hollow curves ends in a very lofty spire which no observer suspects to be of great height. The forest of pinnacles, the thick fringe of pointed, gable-like battlements, and the cutting up of all the broad surfaces by panelling, in no way disguise the clumsiness of the proportions.

A far better result is reached in the neighbouring cathedral of Monza, where a façade of white and gray marble is arranged in a Romanesque disposition with pointed forms. This front is of the years 1360–1390, and shows in a curious way the constant and perhaps unconscious strivings of the Italians to get back to Romanesque forms. This is the more remarkable because the breaking up of the front into five vertical divisions, with the sloping lines of what assume to be the roofs of double aisles, repeats very closely the lines of the front of Milan Cathedral, while the arcaded cornice and fringe of gables over the porch are a further suggestion of that florid design. The cathedral of Como is a simpler and better design as far as its west front is concerned. Except for the niches which occupy nearly the whole height of the pilaster-like buttresses, this front is Gothic as the Italians of the North understood Gothic, and is, without reference to style, a simple and well-proportioned front, with no fault except that the raised central portion, representing the clear-story, has no clear-story behind it, and is without other reason for being than the proportion of the front taken by itself.

A few miles south of Milan is the famous Certosa or Carthusian convent, with a church which was begun in 1396. This is one of the most successful buildings in mediæval Italy, and more than almost any other makes the student regret that the Italians had not the determination to resist the Gothic influence and build exclusively in their own round-arched style. The original front is entirely lost, having been replaced by the superb façade

of 1473 (of which we shall have to speak in Chapter VII.), but the flanks and east end are all of that highly developed Romanesque in which the parts are made extremely light. The fact that the interior is without the iron tie-rods, which are almost universal in Italy, goes to show that so much of the Gothic construction as is used here has been intelligently applied, and combined with an exterior which has nothing Gothic except its rational disposition of parts.

Venice, which has no Gothic church specially worthy of mention as embodying different principles of design from those of the Lombard cities, has a system of civic and domestic architecture which must be noted. There seems no doubt that the traceried arcades of the Ducal Palace were invented especially for that building, the sea front having been finished before 1400. These afford one of the few instances of the composition of the constructional kind reaching its complete architectural effect at the first trial. Figure 170 shows a part of this tracery with reference to its simple and perfect constructive character. It will be noticed that every part is arch construction of the most complete and well-combined sort. Few pieces of civic or domestic architecture can compare with this. Ordinarily the residences and civic buildings of any epoch obtain their exterior architectural effect by the mere forms of the main mass itself and the placing of the windows. If more than this is attempted, it is by means of wholly useless appendages put on to the building for the mere sake of breaking it up into architectural seeming, — or by sculpture or colour.

In the Ducal Palace, however, long open galleries being required, the building which contains the large upper rooms is carried upon the pillars of these galleries by

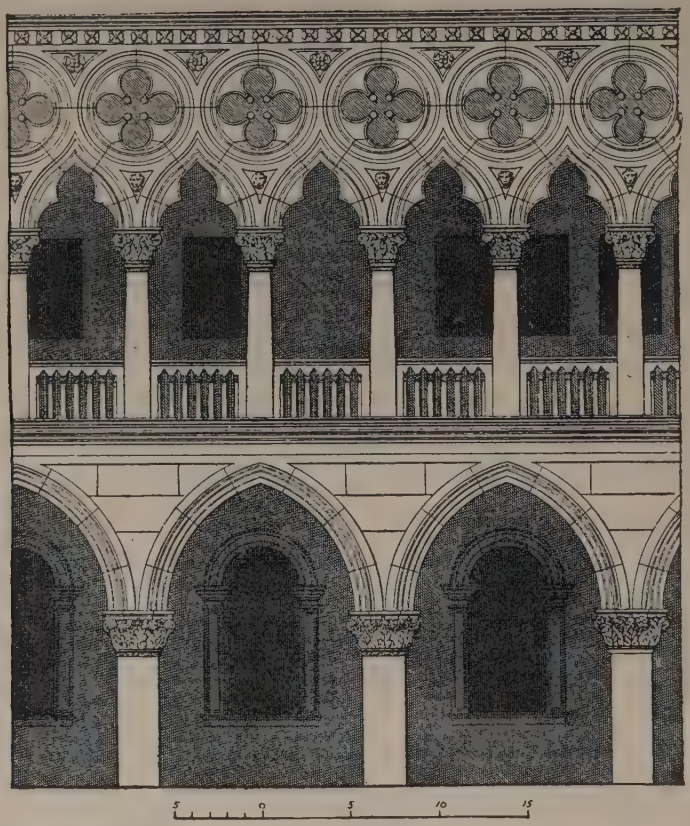


FIG. 170. Venice, Italy: Ducal Palace. Detail of sea front. Second half of fourteenth century.

means of a perfectly successful modification of ordinary Gothic window-tracery. This new tracery would have been absurdly massive had it not the heavy wall above to carry. As it is, it is probably the most successful

piece of civic architecture in Europe. The scheme was immediately adopted unchanged, and also with modifications, by the builders of private palaces in Venice, and the style spread to the cities of the Venetian dominion such as Vicenza and Padua.

One other development of Italian Gothic must be named, — the tombs; compositions which have not their equal in the North. The wall tombs, in which light, cusped arches are carried on twisted shafts, are numerous in the churches of the whole Peninsula, but by far the most important out-of-door monuments are in Verona. There, on the wall which encloses the courtyard of the chapel of S. Pietro Martire, stands the

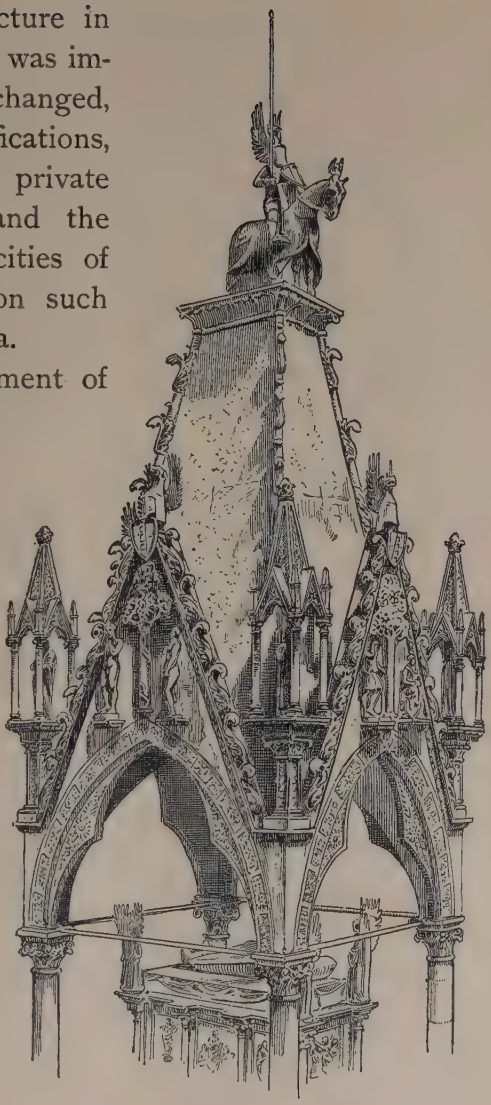


Fig. 171. Verona, Italy: Tomb of Mastino II. After 1351 A.D.

tomb of the count of Castel-Barco; in the little courtyard behind it are three tombs only inferior to the exquisite Castel-Barco tomb itself: other such tombs adorn the fronts or the flanks of the Veronese churches; and the little churchyard of S. Maria Antica contains the monuments of the La Scala family, which for two hundred years held almost undisputed sway over the city. The tomb of Can Grande, who died 1328, is over the church door; the tomb of Mastino II. (died 1351) stands free, a square monument with four gables (see Fig. 171); the tomb of Can Signorio (died 1375) is a structure hexagonal in plan and still more elaborate in design. The tomb of which we give a cut is a piece of ornamental designing which cannot be surpassed by any building of Europe. Its sculpture is as fine as its general design and perfectly fitted to its plan and purpose.

CHAPTER VII

THE ARCHITECTURE OF WESTERN EUROPE ABOUT 1420 TO 1520 A.D. PERIOD OF THE LATEST GOTHIC ARCHITECTURE EXCEPT IN ITALY. IT REACHES GREAT SPLENDOUR AND IS FULL OF INTEREST AND VALUE, ALTHOUGH MUCH OF THE ORIGINAL GOTHIC SPIRIT IS LOST. IN ITALY, AN EXTRAORDINARY REVIVAL OF INTEREST IN ANCIENT ROMAN BUILDING LEADS TO A SUDDEN AND COMPLETE ABANDONMENT OF GOTHIC BUILDING AND DECORATION. THE RENAISSANCE IN ITALY.

I

IN 1422 Charles VII. succeeded to the throne of France and Henry VI. to the throne of England. Two years before this time Henry V. of England had entered Paris, heir of France by treaty as well as by possession of the northern and eastern provinces; but the years after his death were marked by the steady decline of English power on the continent. The years from about 1435 to 1483 were destined to be a great epoch of national growth under Charles VII. and his son, the long-headed Louis XI. Architecture, which had hardly lived during the hideous years of Henry's invasion, came into being again, vigorous, strong, and at a point of development not easy to understand. There had been so little building of importance in what was then France during the long lapse of time from

1340–1420, and so little of what was then built remains to us, that it is hard to trace the evolution which culminated in the Flamboyant style of 1435. Not very many large churches needed to be built; the soil of France was covered with churches which political warfare, not connected now as in earlier and in later times with religious controversy, had generally spared. As there were not many churches to build, there was not much which was new in vaulting; in fact, the great principles of Gothic vaulting had been established; and although it is curious to watch the steady divergence of the English and French systems of vaulting, it is not important to insist upon the changes within the French style.

The church of S. Germain l'Auxerrois at Paris (Fig. 172) is perhaps the first important building known to us of what we call the Flamboyant style, which style was to prevail in France for ninety years and to linger even beyond that period in the lands which took their inspiration from France. The porch of S. Germain with its five arches crowned with reversed curves and sculptured finials, and its rose-window filled with flowing tracery, is well known to visitors of Paris and to all students of architectural illustration, for this is the parish church of the dwellers in the Louvre, and stands opposite the great colonnade of the palace, with only a street between. The interior is less known. In the nave vaulting is seen the curious and characteristic mark of the time, the absence of capitals from the great pillars. This disappearance of the capitals from the principal pillars can only be explained by the fact that the mouldings of all the vaulting ribs were brought to the same

level for their point of departure. This was a recognized principle of the time, and the springing of the five ribs, including perhaps fifty mouldings, from the same level, would naturally reduce the capital which should terminate the vertical pillar to a mere sculptured band. It was felt

FIG. 172. Paris: Church of S. Germain l'Auxerrois. First half of fifteenth century.

that the uppermost course of stone of the vertical pillar required ornament no more than any other of its numerous horizontal courses, and in those times of reason applied to building the logical spirit was sure to prevail over tradition. The disappearance of capitals from the impost near the springing line of the arch is common in the building of the fifteenth century. Figure 173, a detail from the

cathedral of Narbonne, illustrates this novel feature. Slenderness of supports and general lightness of construction could hardly be carried farther than they had been carried in the fourteenth century, but perhaps there is a more marked insistence upon this lightness as an essential decorative feature.

The church of S. Maclou at Rouen is of this epoch, and here we have practically the whole design of a church as one mind may have conceived it, although in actual construction the spire is modern. It is a small church with a very curious polygonal front. Figure 174 gives the pierced gable above the central doorway of the west front of this church, as it was before the restoration, and this gable should be compared with that of Rouen Cathedral (Fig. 150). No better instance could be given of the extreme development of tracery as a principal feature of decorative architecture, which is characteristic of the time. The gables over the porches can no longer be called pierced gables; they have become mere triangles of tracery, which tracery is not filled with glass, merely because it is not important to keep out the weather. The tracery is designed on exactly the same principles as those which govern window-tracery, and, like window-tracery, this has a decorative value which is perhaps found in no other ornamentation which has no reference whatever to natural forms. Nothing in the whole history of architecture

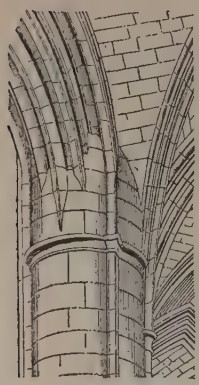


FIG. 173. Narbonne, France: Cathedral. One pier of the choir. Fifteenth century.

can equal it in this respect. The admired interlacings of the Mohammedan styles and those of certain outlying schools of the Romanesque, together with the curious wooden *mesh-rebiya* work, are as far as is the fret-work of the remote East from equalling flamboyant tracery in this respect. It is in itself of a wonderful charm, and it is capable of receiving a further decoration in the way of delicate floral or animal sculpture, as can be seen where the stone work is sufficiently protected to allow of its being sculptured with the delicate forms which it requires. The staircase to the gallery of this very church of S. Maclou is such a piece of adorned tracery, but of later date; its moulded bars are adorned with beasts and monsters, delicate in design and rich in fancy, like an Oriental carving in ivory.

Fig. 174. Rouen, France: Church of S. Maclou. Gables of porch. Second half of fifteenth century.

The detail from the cathedral of Evreux, given in Fig. 175, is a good instance of such combinations of tracery with sculpture.

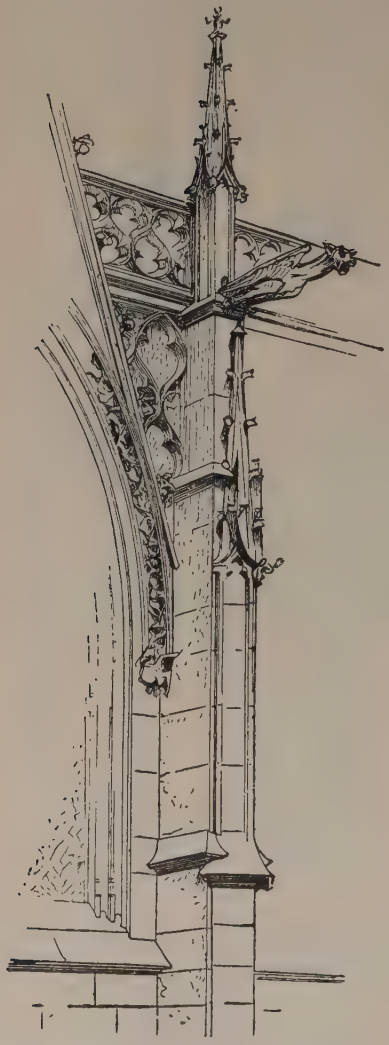


FIG. 175. Evreux, France: Cathedral. Buttress of nave chapels. Fifteenth century.

A more massive piece of architecture is the choir of Mont Saint Michel, on the Norman coast, and other similar structures are the church of S. Jacques at Dieppe, parts of the cathedral of Quimper, in Brittany, the beautiful church of Louviers near Rouen, and the lovely tower appended to the cathedral at Bordeaux, and named, from the bishop who built it, Tour Pey-Berland. A good example of the simpler work of the time is the cloister of the cathedral of Narbonne, built about 1430: Fig. 176 shows one angle of this structure. Northern work of this epoch was commonly lighter in its parts, but the use of mouldings, sculpture, and tracery was the same.

The reign of Louis XI. is, however, the time of the

FIG. 176. Narbonne, France: Cathedral. Detail of cloister. About 1430.

real glory of the Flamboyant style. Between 1460 and 1480 a great number of important churches were built or commenced. At Saint-Pol-de-Léon, besides the beautiful cathedral, there was built during these years the strange belfry-tower of the Kritzker. In this important tower it is most interesting to see the rejection by the builders of angle buttresses. They have built a tower as square and vertical as the Italian campaniles and crowned it with a spire and pinnacles. It rises to a height of 240 feet, and is wholly of granite, but all this lofty and slender structure rests upon four columns and four arches, and is supported above the church floor like the central tower of a thirteenth-century cathedral.

The Flamboyant seems to reach its greatest excellence during this reign of Louis XI., but it is certainly richer in its sculpture and in the combination of that sculpture with architectural reforms during the years immediately following the accession of Charles VIII. (1483), while that king was engaged in the invasion of Italy. S. Wulfran of Abbeville, northwest of Amiens, is perhaps the most splendid late Gothic church in existence. It seems impossible to carry the art of pierced work and tracery farther; and yet, in the hands of the consummate artists who worked here between 1488 and 1510, the building keeps the appearance of a stone structure and has none of the cold look as of a piece of cast iron which we sometimes associate, not without excuse, with the florid late Gothic. The effectiveness of the whole composition is wonderfully helped by the admirable figure sculpture arranged around the great buttress piers of the front, in the jambs of the

doors, in the pediments, and in the pierced gables. It is fantastic, it errs on the side of excessive action, — considered by itself it is like bronze rather than wrought stone; but the architectural designer knew how to keep it in hand and to utilize it as the most effective decoration for his church, the culminating point of the mass of florid ornament. The church at Saint Riquier, not far from Abbeville, is a later study in the same spirit. This church may be said to be imitated from S. Wulfran, but it has its own merits, and it is very curious to see in a more advanced form the tendencies already visible in the Abbeville church. One of these tendencies is seen in the abandonment of deep portals; those at S. Wulfran at Abbeville are reduced to only two rows of niches in the arch and two large recesses for statues below, while those at Saint Riquier are scarcely more than doorways in thick walls. Another innovation is the breaking up of the façade and the flank by huge tower-like masses, in many of which spiral staircases are worked and which are ornamented by the simplest panelling. It seems to have been felt that this including in the composition of broad vertical bands of comparatively simple walling was made necessary by the florid character of the general design. Certainly nothing like it is to be found in the thirteenth-century churches.

Greatly inferior to these brilliant designs of the North are some of the churches in the provinces of the far East. That renowned building standing by itself in a lonely plain, Notre Dame de l'Épine near Chalons, is hardly worthy to rank with the buildings we have named; in

exterior design it is monotonous, it is uninteresting, it has almost no sculpture, and its vast mass — for it is as large as a cathedral — has a vexatious look of cold uniformity, as if of a modern Gothic church. It is curious and perhaps inexplicable that a serious effort was made in the architecture of the interior to return to an earlier style. To describe it in detail is to describe a fourteenth century interior, with its clustered piers, its triforium of small arches supported on round columns, and its simple vaulting; but to examine it is to find the charm of the true fourteenth century work disappear, while none of the flamboyant beauty is there to replace it. The church is known to have been built complete between 1427 and 1472, having been begun in commemoration of a miracle whose date is fixed at 1419. The ruined church of S. Jacques des Vignes at Soissons, whose enormous façade stands like a screen at the edge of the little town, has some of the clumsy immaturity of Notre Dame de l'Épine. On the other hand, nothing can be more complete and

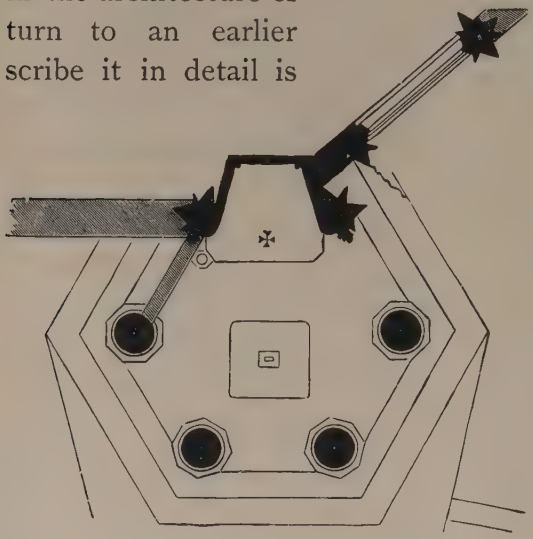


FIG. 177. Avioth, France: Chapel attached to the village church. Fifteenth century. Plan.

FIG. 178. Avioth, France: Chapel (see FIG. 177).

delicately finished in architecture than the *lanterne des morts* at Avioth near Montmedy, in the extreme northeast of France, a building of 1480. In this instance the return to an earlier type in the round columns which form the lowest story, architecturally speaking, and which carry the florid lantern above, is as admirably managed as it was unsuccessful at Notre Dame de l'Épine. Figure 177 gives the plan of this admirable monument, and Fig. 178 its exterior, both from Viollet-le-Duc. As the building now stands it has no glass in the windows of the octagon, and is the worse for this as losing some of its character as a closed building. This exquisite lantern is immediately attached to a church of the fourteenth and fifteenth centuries, a very curious instance of what would be undertaken in a small and poor community which yet was ambitious in the way of building. It has almost no ornamentation except the traceries of the windows and one rather rich door to the west and one to the south. Seen from the northeast the church is as plain and bare as a structure on a Gothic plan can be, except always for the flamboyant tracery of its large windows.

Two splendid church towers belong to this epoch, the northwestern tower of Chartres Cathedral, and, at Rouen Cathedral, the southernmost of the western towers, called *la tour de Beurre*. Other examples, less famous and smaller, abound in many parts of France. The well-known tower of *S. Jacques la Boucherie*, in Paris, is of the very last years of this epoch; and so are, at Rouen, the towers of S. Laurent and S. André and the crowning of the north tower of the cathedral. Northern France

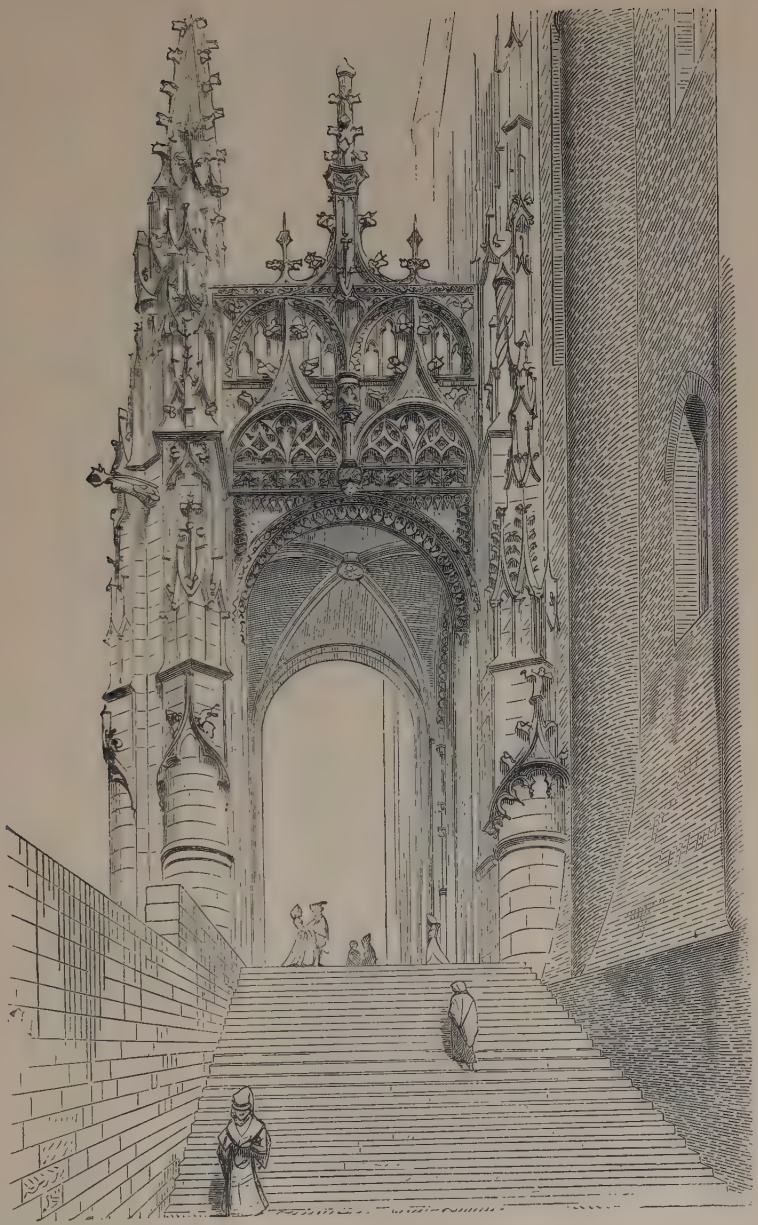


Fig. 179. Albi, France: Cathedral. South porch. Close of fifteenth century.

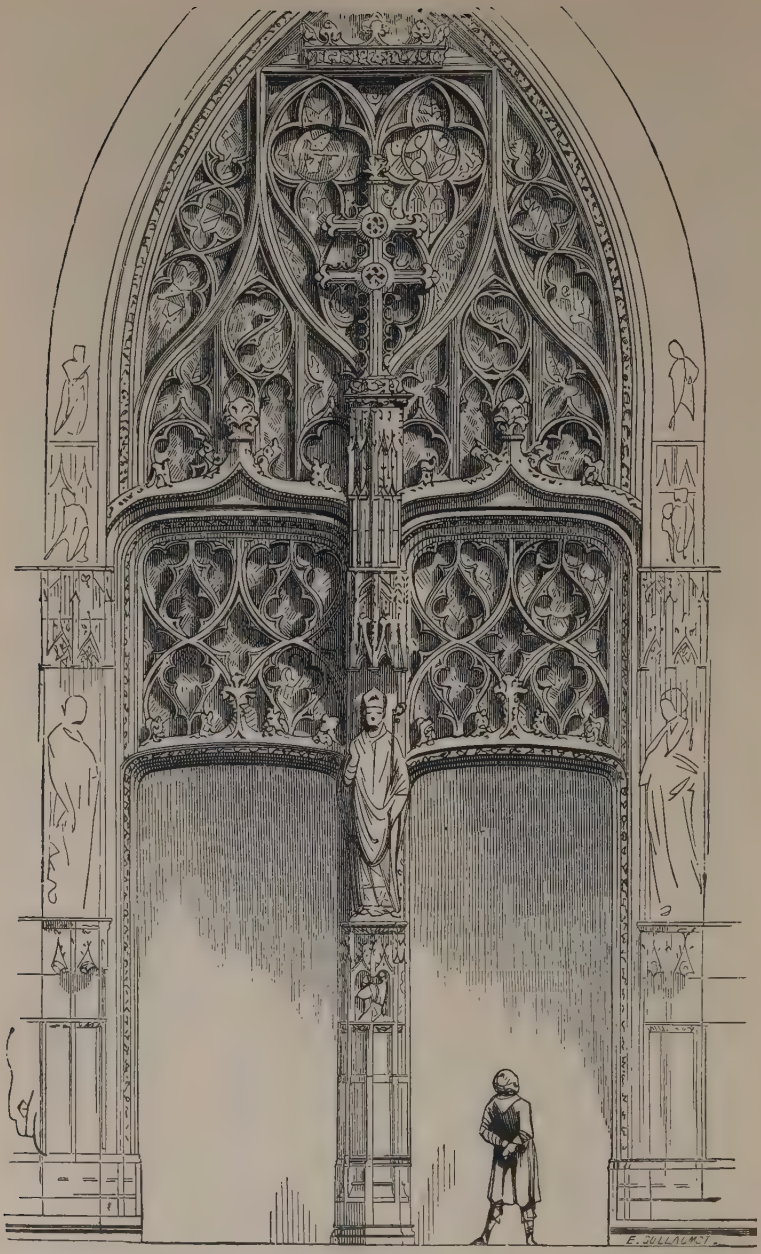


FIG. 180. Tours, France: Cathedral. Central doorway of west front. Fifteenth century.

contains many admirable towers and parish churches of the years 1450–1520, and one church, inferior to none in beauty, is in the South, S. Pierre at Avignon. In these build-

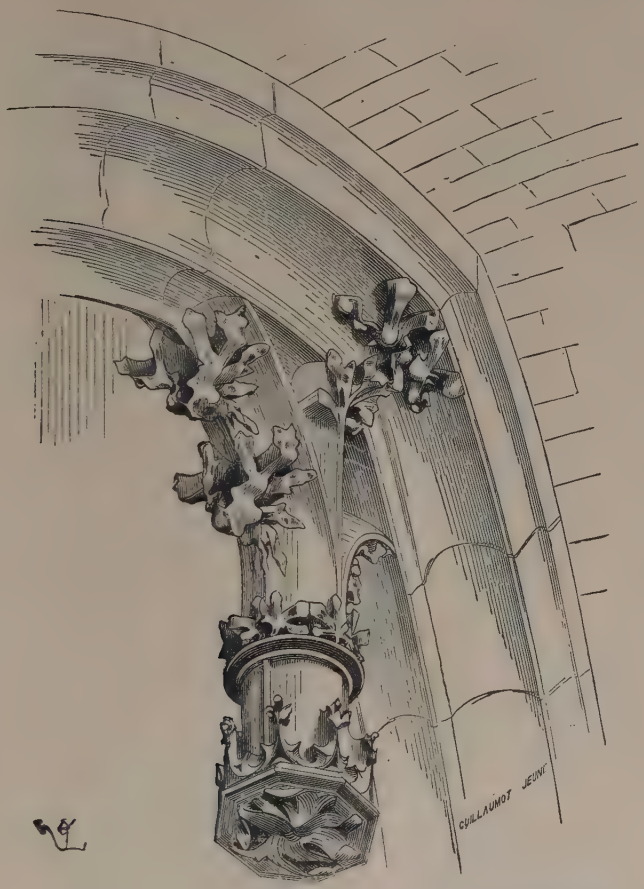


FIG. 181. Eu, France: Village church. Decorative pendant of the choir-vault.

ings the most striking merit is the complete mastery of quaint and varied detail, as shown in the perfect harmony which is maintained in the complete work. The porch

which projects from the south flank of the cathedral of Albi (shown in Fig. 179) illustrates this skill in the management of detail. It is entirely of white stone and is relieved against the brownish red mass of the brick fortress-cathedral (see p. 264). Smaller detail, such as tracery and sculpture of living forms, is equally well used (see Fig. 180, which shows one of the doorways of the cathedral of Tours). Figure 181 is a pendant from the church of Eu in Normandy. Figure 182 gives the beautiful jubé or rood screen of the church of the Madeleine at Troyes, the date of which is 1508.

As an interesting building, half-way between the ecclesiastical and the domestic in character, there may be mentioned the charming little chapel of S. Hubert on the edge of the great terrace at Amboise. A piece of vaulting of the same epoch in one of the great towers of the chateau illustrates what has been said in previous chapters on the loss of character suffered by Gothic vaulting when held between continuous walls of perfect solidity.

The house of Jacques Cœur at Bourges is now fairly well restored, and is in use as a town hall. It is well known by illustrations in all the books. It is an excellent study of planning, adapted to an irregular site and to the ancient towers of the town wall which it was necessary to utilize. The *Palais de Justice* at Rouen is one of the most sumptuous of the civic structures of the time, a magnificent piece of florid Gothic in which intelligent designing and good taste have held in hand what would otherwise be a great excess of ornamentation. One of the gems of the epoch was the Hôtel de la Trémouille in

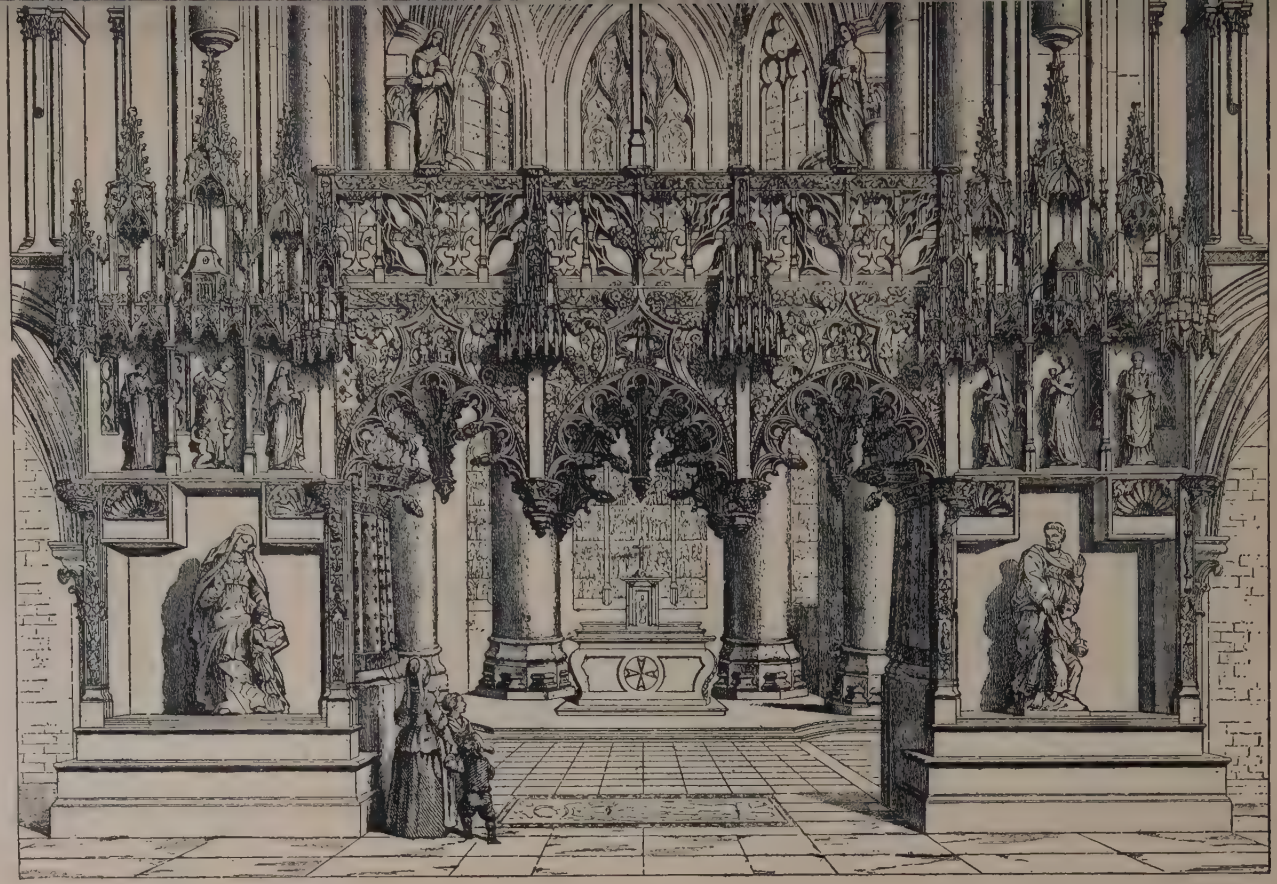


FIG. 182. Troyes, France: Church of S. Madeleine. Rood screen. 1508 A.D.

Paris, destroyed almost within our own times, but recorded by M. Albert Lenoir in trustworthy plates of great beauty. Better known than this is the Hôtel de Cluny, visited by foreigners in Paris for the sake of the

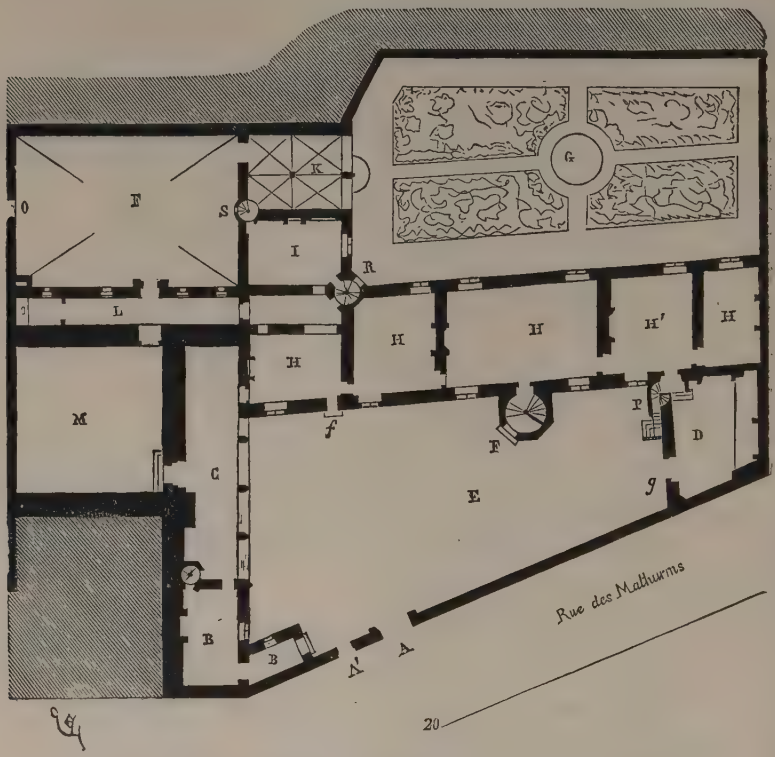


FIG. 183. Paris: Hôtel de Cluny. 1490 to 1520 A.D. Plan.

museum contained in it; but its architecture is perhaps little regarded by them. It is a better type of the stately city house of the day than either of the other buildings named. Figure 183 gives its plan, in which *A* and *A'* are the entrances from the street, *B* the porter's lodge, *C* a

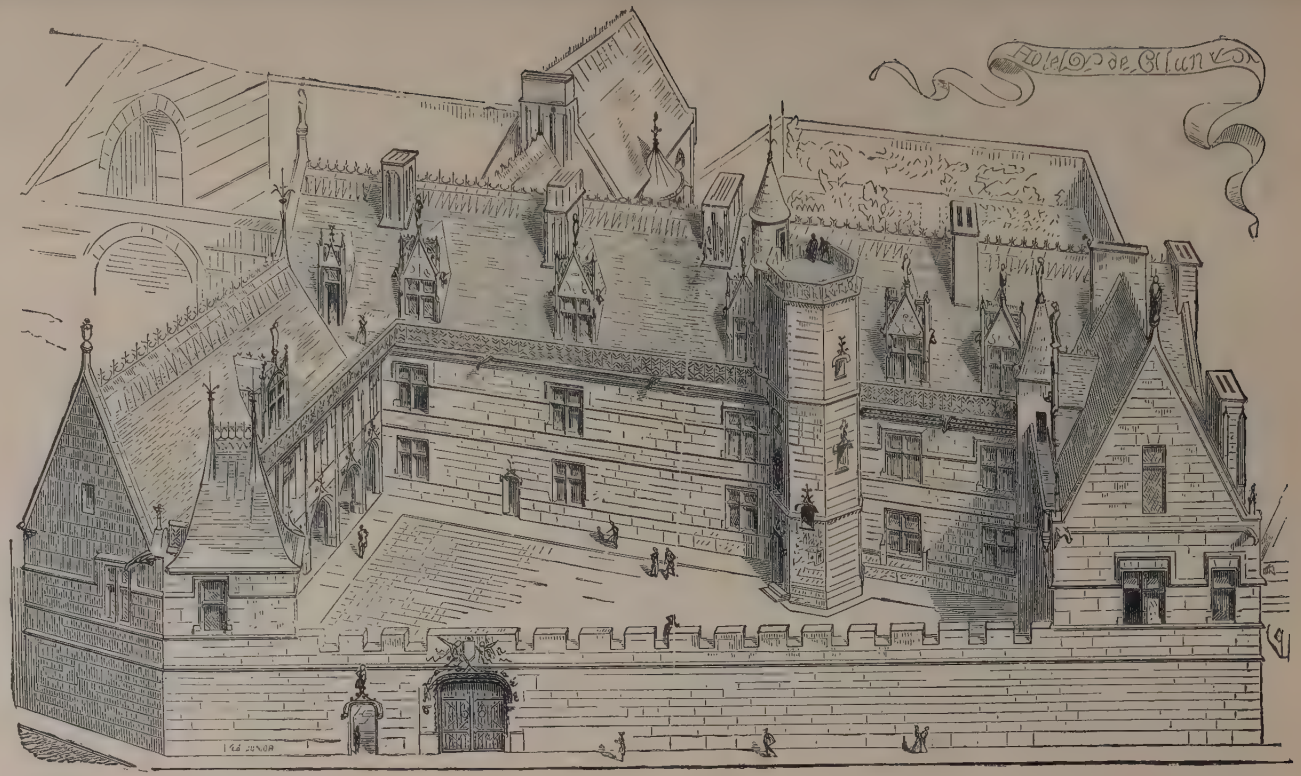


FIG. 184. Paris: Hôtel de Cluny. Compare FIG. 183.

covered portico, *H* and *H'* rooms of the principal building on the ground floor, which are entered from the portico *C*, from the court by the little door *f*, from the winding staircase *R*, and from the kitchen *D*, by way of the small winding staircase *P*. The door *g* leads from the court to the kitchen. *I* is a room, and *K* is a loggia opening on to the garden *G*, and a staircase *R* and the smaller staircase *S* give access to these rooms and lead to the upper story. *M* is a hall of the ancient Roman thermæ. Figure 184 is a view of the same building. It is as plain as any costly house of the day could well be; perhaps its destination, to serve as the Paris home and office of the powerful abbots of Cluny, caused it to be treated with less elaboration of design than the house of a lay-lord.

It became very common in the fourteenth century to build city fronts of wooden frame filled in with masonry. The upper stories of these houses often but not always projected beyond the ground floor. Sometimes two successive projections would be given to the two principal stories above the basement, in which case the basement would often be made of stone and very massive, making an excellent and appropriate contrast with the extreme lightness of the work above. Figure 185 gives a house in Rouen in which the whole front is in one plane, and consists entirely of windows and the panels beneath them. The great window of the basement is an admirable instance of the proper way to manage a shop front.

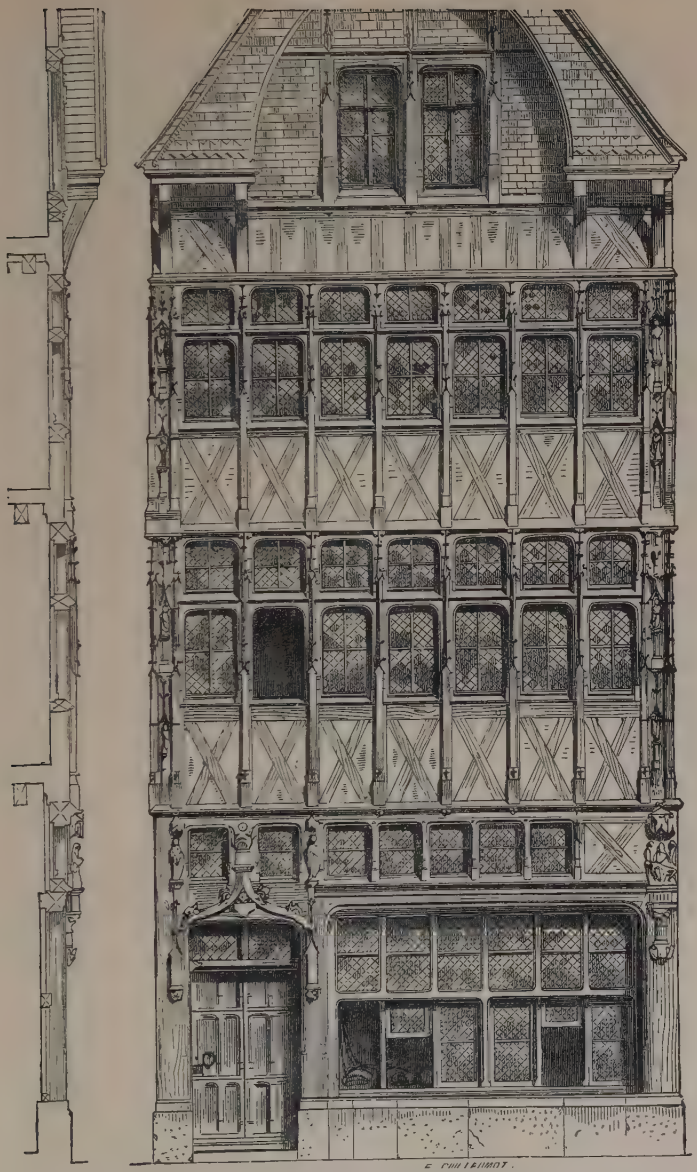


Fig. 185. Rouen, France: House. Second half of fifteenth century.

II

The cathedral tower at Antwerp (Plate V.), begun at the very commencement of our present epoch, is as fine as any steeple in Europe of its class; that is, of those in which all semblance of a roof is given up, and the spire is made a mere ornamental finish and culmination of a highly ornamental belfry. It should be compared rather with the tower of Strasburg than with any within the limits of modern France. Antwerp steeple was the work of a Flemish-speaking community, and Strasburg of a German people who scarcely used the French language. Each of these buildings is altered from the French type; exaggerated a little, forced a little in design, but each is the more interesting for that, and a lover of florid Gothic should study them both. The church of S. Waudru at Mons and the cathedral church of S. Rombold at Mechlin are valuable, on the other hand, for their reserve and gravity of design, as if of an earlier epoch.

The special glory of the Spanish Netherlands, as of the border provinces of what was then France, was, however, in the civic buildings of the towns. The splendid *hôtel-de-ville* of Brussels had been built, except for its tower, as early as 1406. Thirty years later the noble tower was begun, and at about the same time the *hôtel-de-ville* of Louvain, near Brussels, on the east, was undertaken. It is curious to compare this varied and elaborate structure with the far more sedate contemporary town-halls of Douai and Noyon, so near at hand, and one of them at least

PLATE V. PART OF WEST FRONT OF CATHEDRAL OF ANTWERP, BELGIUM

The southern spire never finished. The northern one built about 1500–1510.

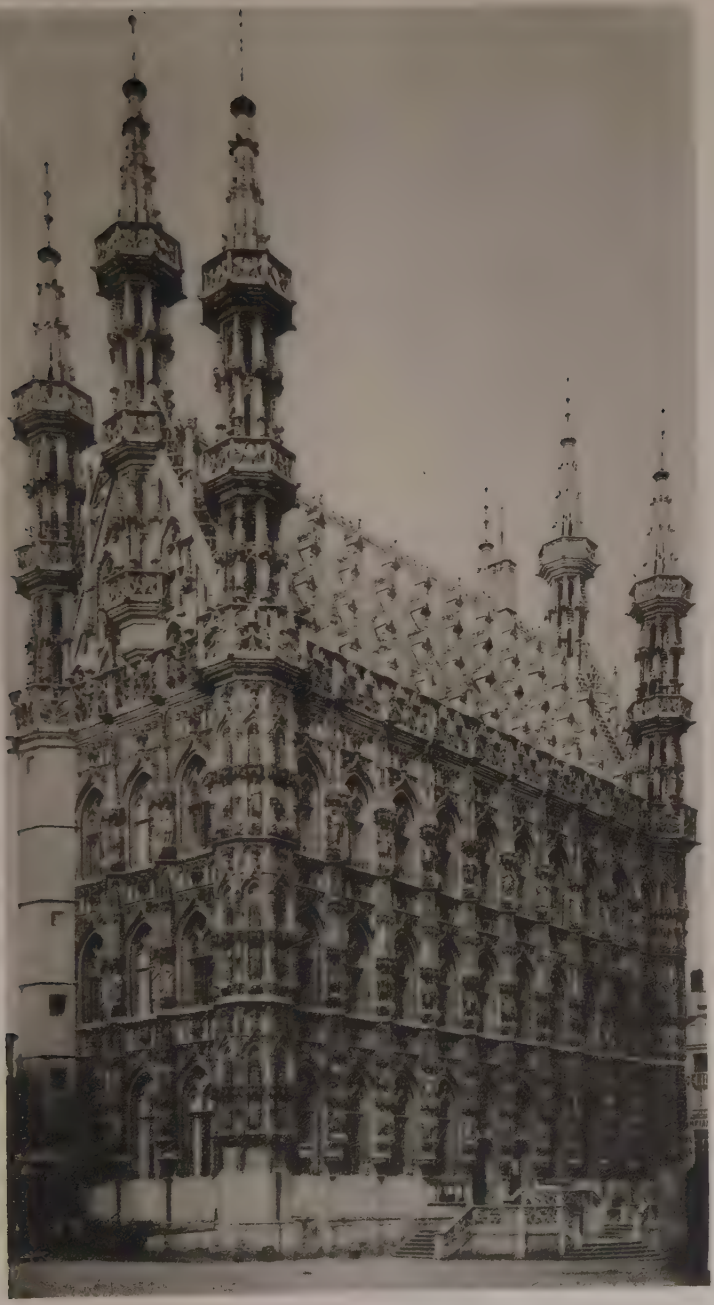


PLATE VI. TOWNHALL OF LOUVAIN, BELGIUM

Built about 1450–63.

hardly French, politically speaking, when the town-hall was built. The building at Louvain is high and narrow (Plate VI.), with three rather lofty stories in its walls and four rows of little dormer windows in its steep roof; it has six tower-like pinnacles of considerable elevation, and an elaborate system of balconies with pierced and traceried parapets. Moreover, a great number of statues of life-size, or nearly as large, throng the towers and the piers between the pointed windows, and each of these is placed in an elaborate Gothic niche made up of projecting canopy and richly carved corbelled support. It is a work of extraordinary beauty and of the highest interest to the student who wishes to see what may be achieved by extreme variety and richness with minute subdivision of light and shade, and with almost no relief of plain surfaces. Most of the celebrated town-halls belong to a later time, but this one remains unexcelled, perhaps unmatched, in fantastic beauty.

In Spain, at the beginning of our epoch, there was in hand the unrivalled nave of Gerona Cathedral. The choir with its aisles and their chapels had been built long before, and the discussion as to what the nave should be was begun, as Mr. Street has ascertained, in 1416. As the proposition was to build a vault twenty-three feet wider than the nave of Chartres, and thirty-five feet wider than the nave of Westminster Abbey, there was doubt and delay, but the vault was finally erected seventy-three feet wide in the clear and of a type as simple as that of the early thirteenth-century French vaulting. In fact, this is a belated piece of thirteenth-century work; the conception of a master mind which was alone in its generation.

Generally in Spain the Gothic architecture of about 1440 and of the following years is of extreme interest, and it is impossible to more than hint at its varied and fantastic grace. The vaulting of S. Thomas at Avila is peculiar, for so late an epoch, in this, that each square of the vault is raised into an almost complete cupola. The subordinate ribs are not of a kind unfamiliar in the French architecture of the time, but the crowning of the centre of the vault seems a reminiscence of an earlier and less florid Gothic. A similar feeling of sympathy for earlier and less elaborate Gothic is evident in the portal of the south transept of Toledo Cathedral, the well-known Door of the Lions. This portal is later than the church to which it is attached; its forms are those of good fourteenth-century Gothic, and only the details reveal its late date, probably 1465. This is the more surprising when we contrast with it the startling novelty of the

FIG. 186. Valladolid, Spain: Church of S. Gregorio. Doorway of cloister. Close of fifteenth century.

PLATE VII. CHURCH OF SAN PABLO, VALLADOLID, SPAIN

West front. Built about 1465–80.

front of S. Pablo at Valladolid (Plate VII.). This façade, which is known to be of about 1460, contains features of seemingly Italian origin mingled freely with details similar to those of the latest French Gothic. It is a composition which seems to dispute with its near neighbour of S. Gregorio, with the church of Brou, and with the convent at Belem in Portugal, the claim to be the most fantastic piece of florid Gothic existing, and yet it is much earlier in date. The question, how far the Spanish architects deserve the credit of the invention of this strange and not unbeautiful architecture, cannot as yet be decided with certainty. The church of S. Juan de los Reyes at Toledo, though of later date (about 1490), is more strictly Gothic in design, and its splendid cloister of about the same years (1470–80) is Gothic in everything except its minutest details. This cloister with its magnificent statuary, at once architectural and sculpturesque, should be compared with the church of S. Wulfran at Abbeville, in northern France. Figure 186 shows a doorway of this epoch; it is one of the doors of the cloister of S. Gregorio at Valladolid. Here there is nothing that is not good Gothic of the time, but the outer doorway of the same convent contains many of the strange non-Gothic, non-mediæval elements spoken of above, and is even more fantastic and unexpected than its near neighbour, the portal of S. Pablo. The strange thing called the Mudejar style may have had some weight in the scale, and the well-known arcade of the Palacio del Infantado at Guadalajara shows nearly what had become of this style at the epoch, late for it, of 1461 (see Fig. 187). It has also been suggested that

some part of the inspiration of these innovating architects, in both Spain and Portugal, came from India by way of commercial intercourse.[1] If this can be established, and if the date of these examples in the Peninsula is certain, the

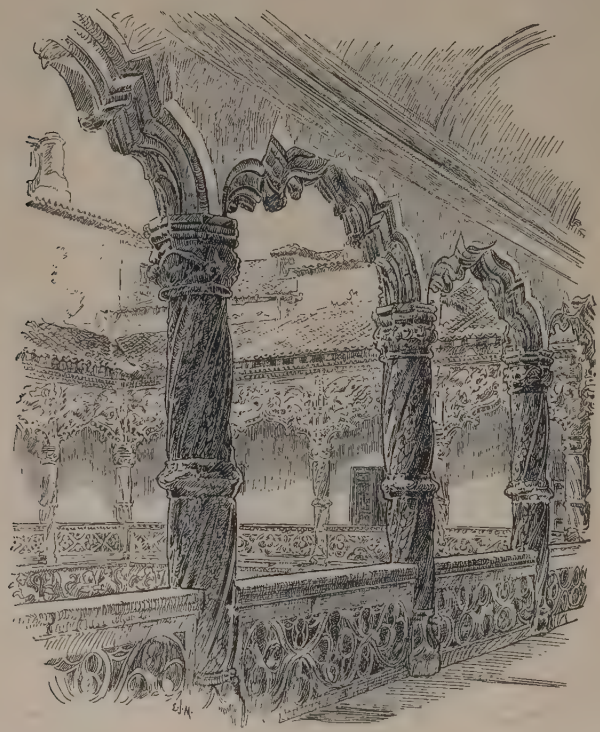


FIG. 187. Guadalajara, Spain: Palace of the Duke of Infantado. About 1465 A.D.

influence of these buildings on the French architecture becomes evident, and an addition is made to architectural history. So far as beautiful and satisfactory building goes, however, the student remains more at home with purer

[1] See Albrecht Haupt: Baukunst der Renaissance in Portugal.

work of the same epoch, such as the interior of the Lonja or silk merchants' Exchange at Valencia.

The last section of this chapter deals with the architecture of the Italian Renaissance, which was contemporary with the florid Gothic of the rest of Europe. In Spain and Portugal the direct influence of the changes in Italy are to be seen at a much earlier time than in France, Germany, or England. They are, of course, contemporary with many florid Gothic structures; thus, at Valladolid, the two large, square courts of the two ecclesiastical colleges, S. Gregorio and Santa Cruz, are of almost exactly the same date (1480–1490). In S. Gregorio the work is not unlike contemporary work in France, such as the covered arcades of Blois; the shafts of the columns are decorated with shallow channelling arranged spirally; the arches are elliptical in shape and moulded richly; the parapets are of pierced tracery; the water of the roof is carried off by gargoyles of mediæval look; in the whole structure there is not the smallest reference to ancient Roman architecture. At Santa Cruz, on the other hand, a severe classic feeling prevails: it is evident that such a structure could never have existed at such a time but as the immediate result of the Florentine architecture of the preceding half-century. There is no such phenomenon as this anywhere north of the Pyrenees and the Alps.

III

In Germany, the middle part of the fifteenth century saw the erection of some splendid church towers. That of the cathedral of Ulm and that of Frankfurt on the Main are of about 1450; that of Strasburg, the most famous of all and the highest ancient tower in Europe, is a few years earlier in date. The spire of the church of S. Mary (Liebfrauen Kirche) at Würzburg is of 1479; that of Thann in Alsace is somewhat later, and that of S. Stephen at Vienna is again earlier in date. These buildings are mentioned together, although varying in time of construction through half a century, because all but one of them are roof-shaped, while the spire of Strasburg, like that of Antwerp, described above, is not in any respect a roof to the tower which it crowns. These two famous spires are not even of the shape of roofs; each is of the nature of a purely decorative combination of bars of stone, resembling Gothic window-tracery, except that it is in three dimensions instead of lying in a plane. Viollet-le-Duc has reproduced a part of the original drawing left from the Middle Ages, according to which the Strasburg spire would have been a higher, a more elaborate, and a far more logical construction than it is; but even as the truncated and simplified design was carried out in stone, it is one of the most surprising and fascinating works of the Middle Ages. Eight sloping bars of stone carry a forest of pinnacles, which are held together by cusped loops of stone, each raking series of pinnacles forming a fringe or crest against

the sky. In this way the spire proper is composed; but the light and open lantern below is an essential part of the composition, and the whole structure, from the platform of the towers to the cross, must be considered as one architectural conception. It must be observed that the spires of the fifteenth century are generally blunter than those of the twelfth and thirteenth centuries, and that this tendency to a lower angle of slope is more strongly marked in the larger towers, S. Stephen's of Vienna being the chief instance of an acutely pointed spire of large size. The spires, which if not roofs are still roofs in shape, are pierced with traceried openings either in part or throughout their whole extent.

Apart from the towers, the German development of true Gothic architecture is not supremely important in the fifteenth century. It is in the use of other materials than the cut stone dear to Gothic art that the German builders did wonders at this time, leaving behind them works which the modern world has never appreciated rightly. Nearly the whole of north Germany is an alluvial plain, in which building-stones are rare, and throughout this region a brick architecture prevailed, which reached its highest pitch, of a somewhat whimsical elegance, about the beginning of the fifteenth century. A typical example is the church of S. Katherine at Brandenburg, on the Havel. It is interesting, in this church, to note the earnest desire of the builder to maintain the purity of the Gothic interior, both in new work of the fifteenth century and in its adaptation to the old, while he allows the exterior to escape from all limits of style and revels in gables and open tra-

cery of baked clay. Many churches of the fourteenth and fifteenth centuries are built of brick and terra cotta, but the buildings which make the most impression are the civic and half-military structures of the time and the private houses. Thus at Tangermunde, north of Magdeburg, the

FIG. 188. Hanover, Germany: Rathhaus. Finished 1455.

church of S. Stephen is akin in style to the above-cited church at Brandenburg, but the visitor is more struck by the ramparts of the town, and especially by one or two of the gateways, with their round towers, battlements, and machicolated balconies of defence, all executed in brick of several colours, and wrought into the most diversified forms. The fortification of Stendal in the Mark of Bran-

denburg and of the neighbouring Werben offer similar instances of military construction of brick treated in a decorative way. The Rathhaus of Hanover is one of the most valuable of the civic buildings in brick; it was restored in a very trustworthy manner about 1870, and is put to its original uses, even to the Rathskeller beneath. Figure 188 shows the principal building of the Hanover Rathhaus, which is made up in the true mediæval way of separately roofed, oblong gabled buildings, adjoining and combined in one design. The cities of north Germany are rich in private houses of this epoch, many of them almost wholly of brick.

The buildings framed in timber were numerous and important in the fifteenth century, but the greater number of them have been, if not destroyed, at least changed in character by later work. A very large house at Halberstadt may be mentioned as having a certain date of 1500, but after the close of our present epoch, 1520, such buildings are more numerous and finer.

IV

In England the year 1420 marks exactly enough the beginning of that long period of modified Gothic architecture which under the later names of Tudor and Elizabethan was to last far into modern times. More than two hundred years later, Gothic forms were still used naturally and in due order of development; the Great Rebellion alone checked the continuous practice of architecture according to Gothic traditions, and even the architects

of the Restoration tried to perpetuate them. In 1420 the Perpendicular style as described in the last chapter was in its full development and was practised universally throughout England and Scotland. The well-known church of Fotheringhay, Northamptonshire, of which the nave alone remains, but which is an admitted model of the style in spite of some solecisms, is of 1434. This church has a lantern or eight-sided light pavilion erected upon its square tower, but there are no preparations for a spire. The tower of S. Botolph's church at Boston, Lincolnshire, is topped in the same way, and is even more celebrated, this being indeed the principal example of a church tower of this design. It is probably of the same date as the tower of Fotheringhay, although the body of the church is much earlier. The lantern at Boston is flanked by four large pinnacles erected on the four angles of the square tower, and from each pinnacle two flying buttresses stretch to the two nearest angles of the lantern. This manner of using such purely constructional features as mere ornaments is a sign of a certain unreality in the work: the true Gothic spirit allows no such vagaries. In these towers the eight small pinnacles of the lantern are also mere ornaments, having lost even their true decorative character as forming a third member in the proportion between tower and spire. Taunton church tower, illustrated here from a drawing made before the recent restorations, is a perfect type of the more usual perpendicular tower. This fine tower, shown in Fig. 189, is somewhat later, and is generally considered to be of about 1500. The late epoch is, however, visible only in some minor

FIG. 189. Taunton, England: S. Mary Magdalen. Close of fifteenth century.

details, and the general character of the building is as purely perpendicular as if it had been a century earlier. This slowness to change is characteristic of the later English Gothic, and is, of course, a necessary part of its unexampled duration. England is full of churches of characteristic Perpendicular style; some vaulted, many more with wooden ceilings. These are all very similar, however, in external treatment, with broad low windows closed with four-centred arches and filled with perpendicular tracery, flat roofs and battlements and pinnacles showing against the sky. Such a church is that of Fairford, Gloucestershire, to which travellers go from London to see the splendid stained glass windows of the sixteenth century. The tower is heavy and unrefined in style, but the body of the church is of great beauty.

From 1430 to 1500 the vaulting of English churches went through some very surprising changes. It grew much lower and flatter in curve. Thus if the main rib across the nave in a vault of 1425 is an ordinary two-centred arch, the vault of 1440 is often drawn according to a four-centred curve (see the Glossary, *s. v.* Arch). If, now, such a vault is flattened still more, it tends to become a three-centred arch, as in Fig. 189 A, in which an interior of about 1465 shows the peculiar vaulting of the time as well as the large four-centred windows, filled with perpendicular tracery. The Divinity School at Oxford, built about 1450, is an instance of a roof whose general shape is that of a flat ceiling with ornamental pendants formed of deep ribs like those of an umbrella hanging from it; but this whole ceiling is supported by very mas-

sive four-centred arches which cross the building from side to side. This is a curious return to the transverse arches of the early Romanesque vaults. Such vaulting is

FIG. 189 A. Warwick, England: Beauchamp Chapel. Finished 1464 A.D.

of extremely decorative effect, but is weak and incapable of being built in wide spans.

The next step was in the direction of that curious tendency of all English Gothic vaulting to develop into a series of half-pyramids which has been spoken of above,

pages 240, 303. Figure 190 shows a part of the outer vestibule which leads to the hall of Christ Church College, Oxford.[1] The strong transverse arch is still retained; but apart from this, the system of vaulting is seen to have developed itself from half-pyramids to half-cones. These half-cones meet a horizontal plane at or near the point of the transverse arch in a series of half-circles, and all the flat surface between these half-circles is really flat ceiling of stone supported by ingenious constructional devices. In such vaulting as this the ribs tend to become mere decorative features. In Fig. 190 the only ribs which are constructional are probably the great transverse arch above spoken of and the wall arches, which are seen to be four-centred in shape. Probably all the rest of the vault is built of rather larger pieces of cut stone with the ribs worked on the surface. There is then a marked tendency to abandon Gothic vaulting altogether, and to reach the desired comparative flatness of roof by resorting to the use of large blocks of stone requiring great skill and command of means for their proper management. Figure 191 gives the construction of the roof of S. George's Chapel at Windsor, in which it will be seen that the sides of the vault where the curve is more decided are built with ribs and filled in behind with rough masonry in the true mediæval fashion, while the middle part, where the curve approaches flatness, is built of

[1] This vestibule of the hall at Christ Church was not built until the first half of the seventeenth century. It is illustrative here of the developed fan-vaulting, and it may serve to explain, in connection with Chapter VIII., the extraordinary survival of Gothic forms in England.

FIG. 190. Oxford, England: Christ Church College. Vestibule to the hall. 1640 A.D. In imitation of earlier work.

blocks of stone without ribs.[1] Here, too, it will be seen

[1] Professor Willis, the author of this drawing, points out in the accompanying text (Transaction of the Royal Institute of British Architects for 1842) that he has omitted the central hollow pendant, and that, therefore, this drawing, though taken from the choir, resembles the vault of the nave.

that the main curve of the vault is three-centred and very low in proportion to its span. This fan-vaulting is one of the most beautiful of architectural conceptions; it is varied and modified in many ways, but it never fails to charm. The three most important interiors that are closed in this way are those of S. George's Chapel at

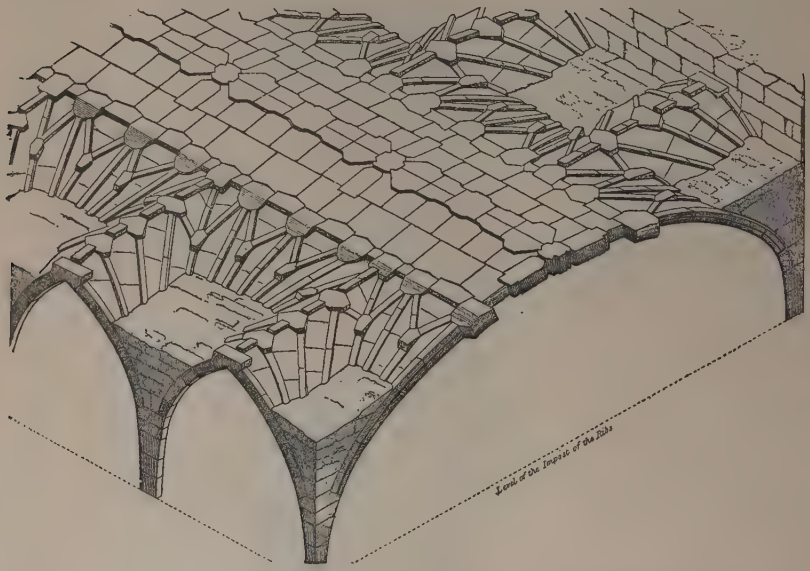


FIG. 191. Windsor Castle, England: S. George's Chapel. Construction of choir roof. About 1510.

Windsor Castle, the chapel of Henry VII. at Westminster Abbey, and King's College Chapel at Cambridge; but beside these there are parts of Gloucester, Oxford, Ely, Canterbury, and other cathedrals and numerous minor buildings, roofed in this way, of which the cloisters of Gloucester Cathedral are perhaps the most notable. Probably the most beautiful of all these roofs, as it is

PLATE VIII. CHAPEL OF KING'S COLLEGE, CAMBRIDGE, ENGLAND

Walls built about 1450-80. Vaulting about 1510. Interior, Looking east.

the most important in size and dignity, is that of King's College Chapel (see Plate VIII.). This interior may claim to be the finest in England, and is capable of comparison with the most splendid cathedral interiors of the continent.

The late Gothic of the years from 1440, freely adopted for domestic and civic purposes, gives us the style so familiar to all in the college buildings of Cambridge and Oxford. This is prolonged far into the sixteenth century and passes imperceptibly into the Tudor style. It has, of course, no influence on the growth and development of architecture, being a mere reproduction, in the outer walls of otherwise plain buildings, of the forms arrived at in the course of more elaborate work, but it expresses to the full that spirit of simple dignity which is so characteristic of the English design of this age of transition. The timber-framed architecture also, characteristic in the fifteenth century of England as it is of Germany, exists for us in greater quantity of the sixteenth century, and the consideration of it had better be deferred.

V

In Italy the true pointed Gothic style had never been thoroughly at home. Undoubtedly one cause of this was the indifference of Italians as a people to the purely constructional and highly organized architecture of the North; another cause was the dislike of many sculptors for a style identified with somewhat rude and semi-barbaric sculpture; but the chief cause was the presence in

the cities of Italy of gigantic buildings of the Roman Empire, ruined by those who had plundered their marbles and their metal-work, but far more complete than we see them in the nineteenth century. These buildings were of a size and dignity beyond the mediæval buildings of Italy, except two or three half-finished cathedrals; and their massiveness was, of course, wholly unrivalled. Moreover, there clung about them the traditions of the undying majesty of ancient Rome.

When, therefore, men's minds were turned toward a revival of classical learning, as they were more and more, continually, during the years following 1400, there were found some among the younger students of building and engineering who were eager to study the Roman monuments thoroughly, and with a view to working in the same style. These students of building were generally sculptors, often woodworkers and inlayers, often goldsmiths, often painters. It was perhaps the general rule that their skill in the art or handicraft came first in their own and the public's estimation: their skill in building second, and rather assumed than real. In their capacity as sculptors or painters of the figure and of biblical or legendary or allegorical subject, antiquity had but little direct influence upon them. The movement toward greater life and freedom in those arts and a far closer study of nature had begun long before. Niccolo Pisano, as early as 1250, had made a great step in that direction, and Giovanni Pisano and Andrea Pisano had followed him. Giotto in 1300 was already a painter in the modern sense. In 1420, when our present enquiry

begins, Brunallesco was forty-eight years old, Lorenzo Ghiberti was forty-seven, and the great Donatello was thirty-nine: their work as sculptors was well begun. Among famous painters, Fra Angelico and Gentile da Fabriano were in middle life, and Masolino and Masaccio, though younger, were at work. Besides Giotto and the Pisani, Simone Martini, Arnolfo di Cambio and Orcagna were dead, and their work was before the world. Fine art, as we moderns understand it, existed full of knowledge and strength; still to grow greater before its decay should begin, but already great. The painters and the sculptors were busy and full of hope and ambition in their especial arts. In their practice as yet no influence from antiquity was visible except the slight stimulus gained from a few sarcophagi and other sculptured fragments; works of a low grade which were calculated to excite wonder and envy by the dexterity of the ancient workmen, but hardly any warm sympathy for the ancient art. With their work as builders it was different. There was not much doing in the way of fine buildings; money and skill were mainly spent upon fortifications and bridges. Moreover, in spite of the splendid neo-Gothic art, which was taking shape in and about the cathedral of Florence, the Italian students of architecture were dissatisfied and restless. Their art, in its half-understood northern form, was not to them what sculpture was to Donatello or fresco painting to Masaccio, an art worthy of all their strength, and demanding it all. They longed for a dimly seen revival of the Roman Empire in its architectural splendours. The younger men were eager to reproduce

Roman forms as they found them or conceived them, and Roman grandeur as they understood it.

Among these younger men was Philippo di Ser Brunellesco, an able sculptor in 1401, and one of those who, in that year, had competed in the matter of the third pair of doors for the Florentine Baptistery. When Ghiberti had been successful in this competition, Brunellesco went to Rome to study ancient buildings. Returning to Florence at some time before 1415, he proposed to finish the cathedral by roofing the great octagon (see Fig. 166 B), not as it had been contemplated, but in a more classical taste. About 1420 work upon this began under his direction, and the present cupola was the result. This is one of the greatest achievements in architectural art. The cupola of the Pantheon at Rome, the largest one known and obviously Brunellesco's chief inspiration, is circular, is supported by a massive circular wall, and is kept in place by enormous masses of masonry piled upon its haunches. The dome of the so-called temple of Minerva Medica is much smaller, and this, and all other Roman domes which Brunellesco could have studied, are of a massiveness which he did not try to rival. We have no reason to suppose that he studied H. Sophia at Constantinople or other Byzantine examples, and no cupolas properly so called had been built in western Europe during the Middle Ages. Brunellesco's work was a marvel of invention and boldness, for his dome, only two feet less in diameter than that of the Pantheon, is light and lofty, octagonal instead of round, and raised upon a high octagonal drum, which rests upon open arches. This cupola

was calculated, also, to support a terminal structure which, built after Brunellesco's death, is in itself a masonry building eighty feet high. Later architects, working in the same direction, have found it very difficult to make a bulging shell of masonry support such a lantern. This astonishing feat must have given Brunellesco supremacy among the builders of the day, but it does not show any marked preference for Roman forms. He had gained inspiration from them in the right way, and in the right way had designed and built an original work. In the Pazzi chapel, adjoining the church of S. Croce in Florence, the Roman details appeared, probably, for the first time (see Fig. 192). The vaulting here is Roman in principle; that is to say it is built as a single arched shell without ribs; but such vaulting was a commonplace of Italian building, and was free to any one to use: the Roman imitation appears in the decoration of the surface of this vault by coffering in the columns with Corinthian capitals, the elaborate system of Corinthian pilasters large and small, and the frieze decorated with the strigil ornament copied from some antique sarcophagus. This is the beginning of modern imitative architecture. It is moreover the only building, as it appears, in which Brunellesco tried to use Roman forms as the Romans had used them. Had the church S. Maria degli Angeli in Florence been completed, the Roman experiment would have been tried more thoroughly in it, but this has remained a fragment. In the church of S. Lorenzo, built during Brunellesco's life, and that of S. Spirito, built after his death, from his plans, both in Florence, the Roman column is used, and a

semblance of the Roman entablature serves as a kind of larger abacus or second capital, but the arches spring directly from the columns in a fashion not identified with the true official Roman style of the second century (see Ch. II), and the entablature is so slight and small as to contradict Roman proportions altogether. Finally, in the front of the palace Pazzi-Quaratesi, there is nothing that an architect of the Roman Empire could have used. This is a palace-front of the type familiar to us, with pointed arches and arcaded cornices, in the narrow

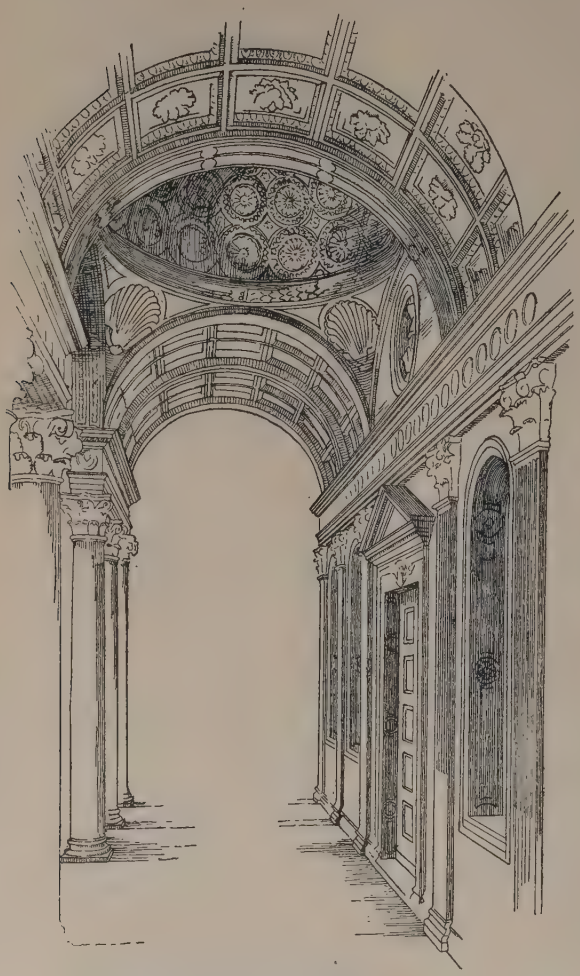


FIG. 192. Florence, Italy: Church of S. Croce. Pazzi chapel. 1420 to 1425 A.D.

streets of the Tuscan towns, but with the details changed. The buildings above named are all in Florence, and their dates are not so widely separated that they need be distinguished as marking eras in Brunellesco's life. They were all built within twenty-four years; except S. Spirito, as above stated. With these was built the beautiful Loggia of the Foundling Hospital (Spedale degli Innocenti), and that of S. Paolo, the first undoubtedly, the second possibly, by Brunellesco; buildings altogether mediæval in form, except that the mouldings have been made to conform to classic types, and that the columns have a partly classical air.[1]

In these buildings the architecture of the Renaissance is set before us, complete, as its originators conceived it. Serious modifications were to be made, as we shall see below, by the irrepressible decorative spirit of Lombardy and Venetia, but the Renaissance proper is of Florence. Brunellesco is its great originator; but there joined him so promptly that they seem to have been notified in advance, Michelozzo Michelozzi, who built for the Medici that palace which we now call the Riccardi palace, Antonio Filarete, and Leo Baptista Alberti. Of these the last is the ideal scholar in architecture, the man of thought, the philosopher, the man interested in the literary revival. It is in accordance with this character of the man that his best known work, the Malatesta Temple

[1] The vaulting of these arcades is not built with ribs, but is solid groined vaulting. In Italy, however, this way of building vaults had never been abandoned, and was freely used for structures not decorative in character, and wherever northern Gothic art was not deliberately copied.

at Rimini, was designed to have a front copied closely from an ancient triumphal arch. Brunellesco would hardly have done that. As we have seen, not knowing what a Roman house-front would be like, he designed one for himself in the Pazzi-Quaratesi Palace, developing types certainly not classic. When Alberti had a house-front to design, he was not satisfied so easily: he could not miss this opportunity to use pilasters, and accordingly the Palazzo Ruccellai in Florence has three orders of Roman

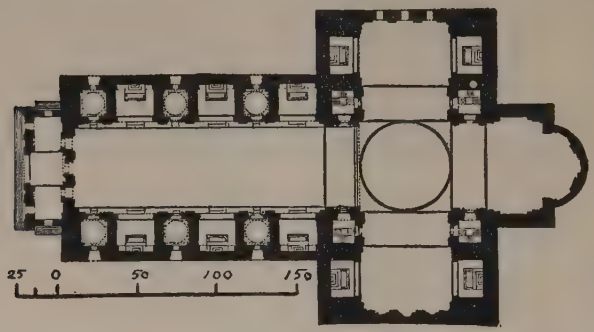


FIG. 193. Mantua, Italy: Church of S. Andrea. About 1475 A.D. Plan.

details. Alberti could design independently, however; his front of S. Maria Novella at Florence is an admirable example of the church-front made decorative by mediæval arcades and inlaying, though not in mediæval patterns. His master-work is undoubtedly the church of S. Andrea at Mantua. The plan of this church is what is most interesting to the student (see Fig. 193). It is evident that Alberti had in mind the massive piers and the plain barrel-vaults of the Roman thermæ, and felt the need of reproducing their appearance, though the actual

ponderous construction was not within his reach. The square masses of masonry which divide the larger chapels are made to pass for the huge solid piers of a Roman hall, though each of them, in the Mantuan church, encloses a smaller chapel. Barrel-vaults spring from one to the other of these piers and roof the larger chapels, and a barrel-vault of fifty feet span roofs the nave. The walls are not really very thick, and the true lightness of construction is seen in the cupola and its lofty drum, which, though probably not built during Alberti's life, are certainly of the original design.

The four architects named above were contemporaries for some twenty years of active life, and their achievements precede by twenty years those of all their rivals in the roll of honour of the Renaissance. In one respect their example was not followed by their immediate successors, in this, that they avoided as far as might be architectural sculpture as a part of their general design. They had misread, or Brunellesco misinterpreted for them, the record of the Roman monuments. They at the same time rejected the splendid architectural sculpture contained in the later Gothic work of Italy, as at Orvieto, Verona, Venice, and Florence, and ignored the large panels of relief sculpture, the scrolls and festoons which make up the ornamentation of the Roman buildings. Brunellesco's most costly building, the well-known Pitti Palace, contains absolutely no external sculpture. The palaces named above, Pazzi, Riccardi, Ruccellai; the façade of S. Andrea, the interiors of S. Lorenzo and S. Spirito, contain nothing in the way of sculpture except

the acanthus leaves in capitals which the order adopted called for absolutely. It is evident that these artists had in mind the procuring of architectural effects by means of proportion alone. To make a flat wall on a narrow street into a work of art by the simple means of dividing it by string-courses into horizontal bands and then arranging simple windows in those bands in perfectly uniform series; to produce in a church an interior effect of grace and grandeur by the proportioning of width to height, column to arch, aisle to nave; to reject at once the constructional interest and the sculpturesque adornment of the construction which the Middle Ages had bequeathed, — all this seemed to them the dignified and stately, the Roman, and therefore the only right way.

When, however, the news of the innovation reached the North, the Lombards and the Venetians welcomed only a part of it. Michelozzo himself, when from Florence he removed to Milan, was compelled to reconsider his theory as it stands embodied in the Riccardi palace, and to accept architecture with sculptured ornament freely used. Fra Giocondo and, after him, Bramante were ready to follow in the path pointed out by the Tuscans, but insisted upon taking their ornamentation with them; and there were less-known artists in the cities of north Italy who preferred to mingle with the classic details something of that which they had learned in their youth. They kept the luxuriance of mediæval sculpture, though they changed its form. They substituted the panelled pilaster for the Gothic colonette, and then filled the panel with sculpture whose suggestion was taken from

Roman arabesques (see Fig. 194); moreover, as the Gothic architects had avoided sculpture other than that applied to constructional features, and had rather avoided panels of bas-relief put up as we put up a picture for the sake of the work itself, this is what the fifteenth-century men especially affected (see Fig. 195). In Venice they used circles and squares of coloured marble to help in this application of rich ornament to their walls. In Venice and in Vicenza they painted their external walls. At the Certosa near Pavia they filled a church-front as full as it would hold of descriptive sculpture; bas-reliefs in which biblical and legendary subject were freely treated. In the Scuola di San Marco at Venice they amused themselves with bas-reliefs of architecture shown in perspective. In the Bank of the Medici of Milan they filled the spandrels with portrait medallions and flanked the pilasters of the doorways with statues as like mediæval

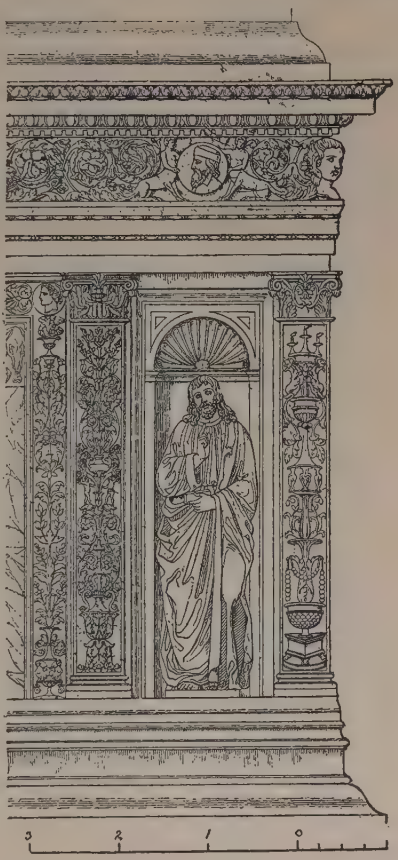


FIG. 194. Certosa, near Pavia, Italy: Church. Detail of front. About 1475 A.D.

portal statues as pseudo-classical costume would allow. In the Cappella Colleoni at Bergamo they filled what seemed to be window openings with colonettes of different elaborate patterns and set upon these a row of little pilasters, as if trying for the effect of the mediæval arcades which they had rejected; and the arcade itself, not to be

FIG. 195. Arabesque: North Italian work. Beginning of sixteenth century.

excluded longer, appears in the crowning story. At the church of the Miracoli at Brescia the panels filled with arabesques, which are freely used elsewhere, cover the whole front. In all these buildings and in the cathedral of Como, in S. Maria delle Grazie at Milan, in the Casa Stanga at Cremona, in the court of the Palazzo Vecchio at Florence, and in a hundred other monuments, the

columns and the colonettes have their shafts sculptured as richly as it was possible to carve them.

The Italians have never been an architectural people in the highest sense. No great style of architecture has originated in Italy; nothing that can compare with Greek or Byzantine, early Egyptian or Gothic. An artistic race is not necessarily great in architecture, nor, on the other hand, are good builders necessarily good architects. The Roman engineers of the Empire were excellent builders; the Italians of the fifteenth century were an artistic race of the highest gifts and in the noblest mood of devotion to art, their work in painting, from walls to manuscripts, and in sculpture, from colossi to sword-hilts, was unequalled by any work done since the great times of Greece; but to neither set of men was it given to create a great architectural style. The nearest approach to it was probably the work of those artists who in Venice and the neighbouring cities rejected the pointed arch, the ribbed vault, and the clustered pier, but kept the mediæval framework in other respects, and adorned this as seemed to them good with sculpture of human subject and of pure ornament freely intermingled. This school of art may be represented, as to its simple type, by S. Zaccaria at Venice, built between 1456 and the end of the century. Figure 196 gives its front, which has the fault, common to so many Italian churches, of being a façade only, and not the natural and inevitable facing of the wall in which is the principal entrance, and this fact alone shows how far away was the possibility of a great style of architecture growing out of the renaissance work. The front, considered as an inde-

pendent architectural design, is beautiful and deserves the praise which has been lavished upon it. The richer type is seen in the façade of the church in the famous Certosa or con-

FIG. 196. Venice, Italy: Church of S. Zaccaria. Façade. About 1490 A.D.

vent of Carthusians near Pavia already cited. It is crowned with ornament delicately sculptured in relief and also inlaid, and among its ornament are many statues and extensive and elaborate compositions in relief telling the Bible story, the

legendary stories of the Carthusian fathers, and the memorials of Giovanni Galeazzo of the Visconti. In this front the attempt to combine sculpture with architectural forms is as seriously made as in a Gothic cathedral. There are a few evidences of uncertainty as to where the richest sculpture should be placed and as to how statues could be combined with relief sculpture for the double purpose of the religious and traditional record and the decorative effect. These uncertainties are the inevitable signs of a new style taking shape, just as the circular window in the square frame made of pilasters and entablature shows the undeveloped style. Had this been a building age, and had the Milanese of 1475 been an architectural race in the sense in which those terms are applied to the year 1250 and the people of northern France, other buildings of this same decorative character would have succeeded to this one, and these uncertainties would have disappeared. The front of the Certosa Church must have been completed as we now see it about 1510, but the design dates of course from about the year of its commencement, about 1490. Ambrogio da Fossano has been credited with the design, but it seems established that Omodeo rather deserves the credit of it as far as this can be ascribed to one artist.

The work done by Donato Bramante in the north of Italy must be considered in this connection. It is quite certain that he built the cupola and the apse of S. Maria delle Grazie before the year 1480, and the beautiful porch of the same church is probably his as well. This porch has been the prototype of a hundred porches and is freely

copied to-day, but no one has tried to rival the beautiful design of the choir-end of the church, and the sixteen-sided tower which crowns it. Similar many-sided cupolas exist indeed, such as that of the chapel adjoining S. Eustorgio built by Michelozzo of Florence about 1475. What was to be the ornamentation of the great panels which form with the windows a horizontal band around the church seems to be wholly unknown.

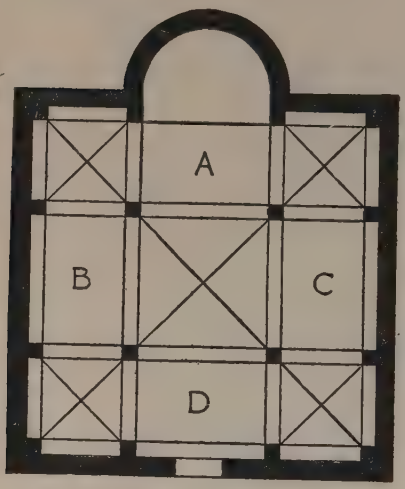


FIG. 197.

In the main, the architecture of the Renaissance in Italy is mediæval in the plan and general shape and character of its buildings, as was inevitable, but a few changes are introduced which are of peculiar interest. Some of these are pieces of pure reasoning, so far as we can judge; others may be revivals or survivals of earlier practice. The plan of several North-Italian churches is of the general character shown in Fig. 197, the four spaces *A B C D* being roofed with barrel-vaults, the central square with a higher cupola, the four smaller squares with lower cupolas or with groined vaults, and the apse with a semi-dome. These churches being generally small, a single door of entrance in the wall opposite to the apse is thought to suffice. Such a church is S. Fantino at

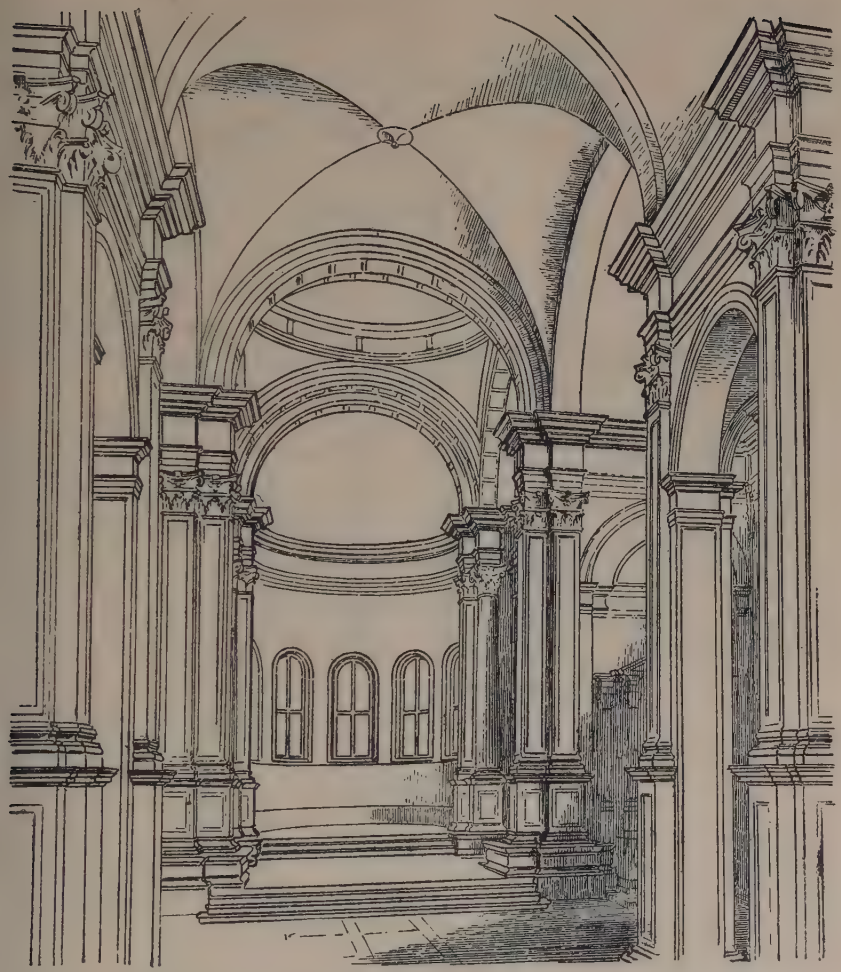


FIG. 198. Venice, Italy: Church of S. Fantino. Nave about 1510; choir about 1523 A.D.

Venice, except that here a second square is added, lengthening the nave, and that the compartment *A* is roofed by a cupola on pendentives. The interior is shown in Fig. 198.

A simpler plan is that of S. Maria Nuova at Cortona (Fig. 199).

It will be seen that this plan is exactly that of the Pretorium at Musmiyeh (Fig. 33). Another plan is a perfect Greek cross in shape, each arm vaulted with a barrel-vault, and the central square with a cupola; in short, the plan Fig. 197, with the four corner squares omitted and the wall enclosing the remaining floor space in the shape of a cross with equal arms. The two lovely churches, that of the Madonna di S. Biagio at Montepulciano and that of the Madonna del Calcinajo on the hillside near Cortona, both in Tuscany, are examples of this. Figure 200 gives the plan of the first-named church, showing its severe plainness of treatment. The complete dependence of its designer is upon proportion, conceived in a would-be classical manner. A third plan is a regular octagon, each side occupied by a deep niche or recess large enough to form a chapel. The best example of this is the important Church of the Incoronata at Lodi. A porch at one side, where the entrance took up one of the eight niches, and an apse at the opposite side

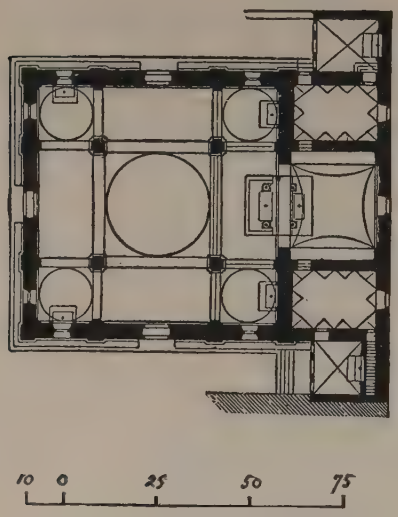


FIG. 199. Cortona, Italy: Church of S. Maria Nuova. About 1535 A.D. Plan.

replacing another niche, completed the plan of such a church. All these plans, and several others in common use, are nearly or quite unknown to mediæval art, and their invention or revival is a sign of the earnest seeking in Italy for whatever in architecture was non-mediæval and, therefore, presumably classical. We are never to forget that this age of splendid artistic achievement was an age absolutely uncritical and absolutely devoid of the archæological sense.

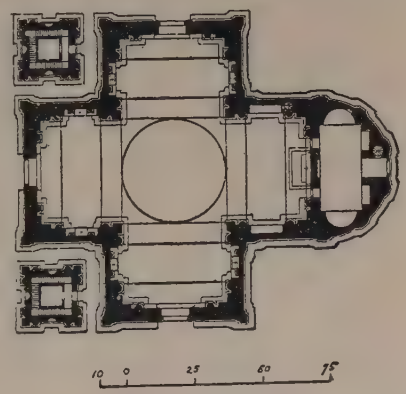


Fig. 200. Montepulciano, Italy: Church of S. Biagio. 1513 A.D. Plan.

As for the details of the architecture, whether constructional or purely decorative, the representations in paintings and wood-cuts of the time must be studied, as well as the buildings actually erected. This would always be a fruitful study. Architecture is that one form of fine art which suffers the most from lack of funds. Nearly always in the past, great architectural undertakings have ruined those who had to furnish the means for them, or else have remained incomplete. The Roman imperial administration had unlimited means, and so had some of the pre-imperial masters of the Roman world, the men who had vast provinces to deal with and hundreds of thousands of captives to sell as slaves, — Sulla and Pompey and the great Julius. In a quite different way and for a brief moment of time, the cathedral build-

ers of 1200–1250 seem to have been able to disregard the money question. There are few such epochs in history, and the years of the Italian Renaissance did not make up such an epoch; all architectural effect was hampered by lack of resources.

In August, 1514, Raphael was appointed, by especial brief, architect in charge of the work at S. Peter's. In appointing a painter to such a position, mediæval and early Renaissance examples were followed, but during the century which had just elapsed the arts had become much more differentiated than of old. This, indeed, was inevitable when the work which a painter was carrying on, and which he would have to put to one side when he undertook sculpture or architecture, was of the character and extent of that which Raphael had had in hand for the previous six years. Raphael's hand is not very plainly seen in S. Peter's, and his work upon the Loggie and the vaulted halls of the Vatican are impossible to separate into the work of Raphael and that of his predecessors. Those predecessors were men of great rank as architects, and men whose character as designers in architecture it is impossible to mistake. Donato Bramante and Fra Giocondo were still living, and they and their advice and instruction, which they seem to have been ready to give to the court painter and the pope's especial favourite, are to be considered in any analysis of the work ascribed to Raphael. Moreover, that great painter was one who worked easily as the chief and organizer of a corps of skilled assistants. Raphael is said to have made the work of Vitruvius his special study at this time, and

it is recorded that he had to do with the translation of that book into Italian after the death of Fra Giocondo, who, as we have seen above, had interested himself in the one book on architecture which had come down from Roman antiquity. It must be remembered that the work of Vitruvius, "Ten Books upon Architecture," is far from being an adequate treatise upon the Roman practice in building in the time of Augustus, or upon the right way to use Greek models and to follow Greek example, or upon theories of construction, or upon the history of architecture in the past, or upon abstract principles of design, or upon his own experience and practice. As a large part of the manuscript is devoted to fortification, to roads and bridges, to water supply and the building of aqueducts, and to similar engineering questions, and another considerable part to sun-dials, the medicinal and hygienic effect of certain springs and rivers, to military engines and other such unarchitectural questions, the space devoted to architectural design is extremely limited. The style is rugged and obscure, and even in our own time many passages remain, the exact meaning of which is disputed. It is certain that to students who did not know Greek buildings at all — for it seems that even the ruins at Pæstum had attracted no attention — the constant reference of Vitruvius to Greek authority and Greek examples would necessarily be misunderstood. In an age quite devoid of the archæological sense, and possessing no science of archæology, the attempt to explain the Roman remains by means of Vitruvius' manuscript could not fail to end in total confusion. What actually took place under the

direction of Giuliano and Antonio da San Gallo and their contemporaries was merely this: they took the work of the architects of the early Renaissance who had used columns and pilasters freely, — that is to say, the work of such men as Michelozzo, Alberti, and their still living but very aged successors, Bramante and Fra Giocondo, — and began to make it more classical by applying to it the examples found in the ruined buildings throughout Italy. Thus the Forum of Nerva gave them the entablature breaking out into a projection or *ressaut* at each column (see Fig. 45); the topmost story of the Colosseum gave them an order of pilasters of very great length, tending to persuade them that such a row of upright members, equally spaced, might be continued indefinitely; the lower stories of the same amphitheatre and parts of many other edifices gave them the Roman order as shown in Fig. 44; and capitals and other details which were found underground were in better preservation than those in place in ancient buildings in the city, and were not to be disregarded even in their minutest parts. In fact, the architects of the early years of the sixteenth century declared that there should be no more of that independent and dashing design in which the Venetians and the Milanese had been so strong, nor of the more sedate but still fresh and novel work of the Florentines and Romans. The question now was how to use the ancient Roman details, unaltered as far as possible, and to decide just how far they might be modified where change was inevitable. The employment of Raphael upon S. Peter's, and the application of his alert and ready mind to architectural

design, marks this change, in a sense. Raphael was eager in directing and suggesting excavations in Rome, and, as we have seen, applied himself to theoretical study. The fact that he did so in so purely classical a spirit is evidence of the state of feeling at the time. His few admitted genuine architectural works show the condition of this feeling from 1515 to 1520, and illustrate the transition

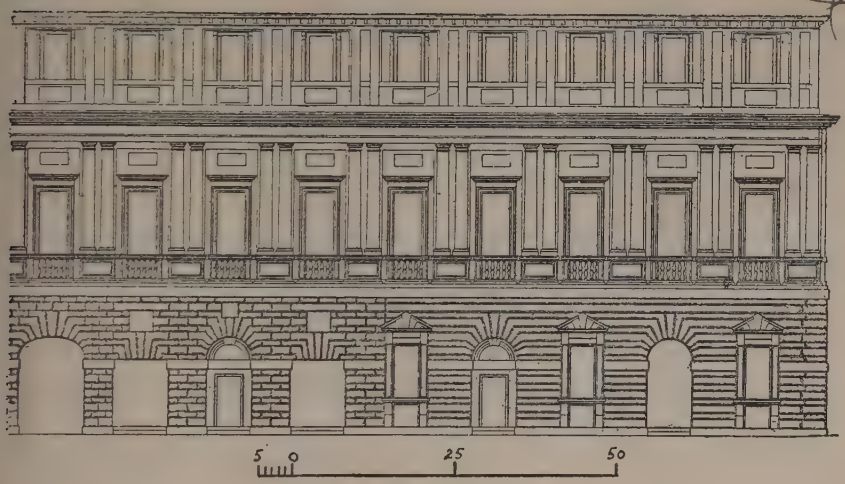


FIG. 201. Rome: Stoppani-Vidoni Palace. 1515 to 1520 A.D.

from the *rinascimento* to the *classicismo*. Figure 201 gives a part of the front of the Palace Stoppani-Vidoni in Rome between the Pantheon and the river. The whole front consists of seventeen bays. It is hard for us, at the close of the nineteenth century, to trace the classical Roman sources of some of these details. Thus the rustication of the basement and the balusters which support the window-sills, perhaps also the use of the pediment over

the small windows in the basement, may easily have come from buildings since defaced or destroyed; for the ruin of the antique remains between 1500 and 1750 was continual and most disastrous. We may feel tolerably certain that the coupled columns and coupled pilasters were an invention of the sixteenth century. Probably no ancient Roman structure furnished an example of an exterior of house or palace, and the sixteenth-century men were puzzled by the question how far their walls and piers might remain bare and unbroken surfaces. Evidently the designer of the Stoppani-Vidoni Palace was afraid of a blank-wall surface. He filled the narrow piers of his principal story, which had a width between the projecting architraves of the windows of only six feet, eight inches, with two pilasters on a common pedestal, giving an effect of crowding which was certainly not classical Roman. The mouldings and their combination and the arrangement of the order are, however, most carefully studied from the antique. This example, then, is offered as an instance of the latest Renaissance passing into the neo-Roman which was to succeed it.

MUNICIPAL SCHOOL OF ART

CHAPTER VIII

THE ARCHITECTURE OF WESTERN EUROPE, 1520 TO 1665 A.D. THE NORTHERN NATIONS FOLLOW IN A HESITATING WAY THE EXAMPLES FURNISHED BY ITALY DURING THE PREVIOUS PERIOD (1420–1520), BUT EACH PEOPLE WORKS OUT ITS OWN RENAISSANCE, AND THE PURE AND EARLY ITALIAN RENAISSANCE OF 1420–75 HAS NO IMITATORS. SPAIN HAS HER OWN PECULIAR AND MORE NEARLY ITALIAN RENAISSANCE. ITALY GOES ON TO THE MORE FORMAL CLASSIC STYLE, BUT STRONG RENAISSANCE FEELING STILL EXISTS IN THE NORTHERN PROVINCES.

PREFATORY NOTE

THE classical Renaissance in architecture is of course wholly Italian in its origin, as has been shown in Chapter VII. It is to be seen, completely accepted, in Italy eighty years before any decided effect from it is visible in France, the Netherlands, England, or Germany,—influencing Spain meanwhile, but only slightly. After 1510 all the above-named lands show traces of that Italian influence, but it works slowly, and each people allows it only so much weight as this,—that they abandon Gothic methods, though slowly and reluctantly; and as they cast about for new ways of work, admit with great reserve the classic style as used in Italy. This condition lasts for more than a century; and when we remember how rapidly Gothic

methods of building were taken up, as described in Chapter V., this slow growth of the classical Renaissance in architecture is surprising. The reason for it is, that whereas in the twelfth century the Romanesque style was in use everywhere, and Gothic was but a slight modification of it, commending itself at once, in the sixteenth century the Gothic style was in use everywhere except in Italy, and the revived classic methods were a complete denial and reversal of it. Therefore, though Italian influence was always present in the building of northern and western Europe from about 1510, it was not predominant until much later, and was never accepted without question until the reign of Louis XIV. The preference of that monarch and his ministers was for the stately quasi-Roman colonnades, which seemed to them to express the spirit of a powerful modern, centralized state, modelled on what they thought a Roman model. The colonnade of the Louvre and the palaces of Marly and Versailles did what direct Italian influence had never been able to do, and brought all northern Europe into uniform practice in these matters, so that after 1665 national styles tend to disappear, and the one grand would-be classic style to prevail alike from Naples to Stockholm. This chapter is devoted to the era of transitional styles, in which mediæval independence and Italian influence are striving for the mastery. Chapter IX. will describe the era of uniformity.

I

The march of Charles VIII. through Italy in the years 1486–88 is generally set down as the event which introduced the French nobles to the buildings of the Renaissance in Italy. This common opinion is sufficiently accurate to be left undisturbed. It was not only the imitation of the classic architecture which pleased, in Italy, the northern princes, — it was also the sight of extensive and elaborately planned villas and princely residences in city and country, in which comfort and luxury had been considered before the needs of fortification. It is in accordance with this view that the first important step taken in France in the way of non-Gothic architecture was in the adjustment of some of the old strong castles to the requirements of petty local courts and the almost complete abandonment of their defensible character. In making these changes, suggestions of the new Italian art occur; here a doorway ornamented with pilasters, and a fantastic *fronton* which might be called a pediment, there a series of windows, newly cut through the heavy old walls, and adorned with pilasters and entablature which present a far-away resemblance to Roman forms. Such chateaux are to be seen in that well-known country on the Loire, concerning which and its picturesque castles and manor-houses so much has been written. Chaumont on the Loire between Tours and Blois, Azay-le-Rideau near Tours on the southwest, Chateaudun in *La Beauce* half-way between Blois and Chartres, and, further

west, Josselin in Brittany, north of Vannes, are all groups of buildings of this mixed character. In these, with no royal or semi-royal profusion, as at Chambord and at Écouen, the lord of the manor has rearranged his ancient manor-house with more or less rebuilding according to the classical fancies of the court. With these may be compared the chateau of Meillant near Bourges, which, although refitted at the beginning of the sixteenth century, was left in the florid Gothic style. Some buildings newly built at the same epoch contain a very similar mingling of classical forms in a hesitating and uncertain fashion, with a general plan and a conception of the building as a whole as purely mediæval as is the greater part of its ornamentation. The *Hôtel de Ville* of Noyon in northeastern France was built between 1485 and the close of the century. All its windows, without exception, are of late florid Gothic; the doorways on the court are of the same style, and of the same style are the exquisite niches for statues between the windows of the upper story on the street front, and the band of delicate sculpture which separates the stories. Into this Gothic front facing on the quiet square is intruded a door-piece consisting of two pilasters and an entablature enclosing a doorway with a three-centred arch and minor pilasters, and the façade is completed by a sort of attic with bull's-eye windows, and finishing in a classical cornice, above which arise dormer windows, pinnacles, and a round pediment of completely Renaissance character. It may well be that these entirely classical features were added after the close of the century; but the contrast between the late Gothic

and the early Renaissance forms is frequently shown us in that way, — a building begun under the florid Gothic régime and finished by hesitating adoption, a few years later, of details brought from Italy. In other cases buildings were begun and completed in the same style throughout. Among these, the florid Gothic is for a time contemporaneous with a completely realized non-Gothic style. Thus the church of Brou, a suburb of Bourg-en-Bresse near Macon in southern Burgundy, is wholly flamboyant Gothic, without the slightest invasion of forms brought from Italy. Although begun about 1510, it was not completed until 1536. The *Palais de Justice* and the church of S. Maclou, both in Rouen (pp. 330 and 342), were not finished until 1535; and the south portal of Beauvais Cathedral is of even later date, perhaps as late as 1545. All the above-named buildings are florid Gothic in style.

If the buildings undertaken by the Cardinal George of Amboise had been completed and had been preserved to us, we should have had one or two specimens of the classical Renaissance in French architecture of a much earlier date than any that remain. Jacques Androuet du Cerceau has preserved in one of his books views of that remarkable chateau of Gaillon near Rouen in Normandy, which, although begun under Louis XI., was continued in the Italian taste between 1502 and 1510, and perhaps from the designs of an Italian architect. This building, in the parts erected for George of Amboise, was clearly such a palace as a thoroughly enlightened and very wealthy French noble would have dreamed of building

at this time: here is an example of what the companions of Charles VIII. must have longed for. But of existing works of this early period and purely Renaissance in character we have only, besides the fragments of the chateau of Gaillon, both on the spot and in the court of the *École des Beaux Arts* in Paris, such small structures as the tomb in the cathedral of Nantes. This splendid altar-tomb is dedicated to the last independent duke of Brittany and his wife. The sides are divided into arcades with splayed archivolts and jambs; and these and the pilasters between the arches are nearly of Italian form, and are filled, in the Italian taste, with delicate arabesques. This tomb, the work of Michel Colomb and Jean Perréal, was certainly executed before 1508. Still more surprising is the tomb erected about 1506 to the children of Charles VIII., and which stands in the church of S. Gatien of Tours. This is a sculptor's rather than an architect's design, but it is of the revived classic style in every part, and reminds the student that the Renaissance was eighty years old in Italy, though hardly born in France. Of the same date is the mutilated tomb in the cathedral of Dol on the Breton coast, near Saint Malo. This is dedicated to the Bishop Thomas James, and was erected in 1507; it is in style completely Italian of the Renaissance. To find parts of existing buildings as early as these monuments and, like them, in the classic manner, we have to seek for details of those chateaux of the Transition of which mention was made in Chapter VII. If the splendid chateau of Azay-le-Rideau can be proved to be of as early a date as 1510, it is the first

of these great mansions to show the imprint of the Italian Renaissance in its details. The contemporary structure at Blois, forming that wing of the castle in which the entrance is situated, and called the wing of Louis XII., is still transitional in character, and almost exclusively mediæval in its details, although built under the direct influence of the court. In the same city the dwelling-house called the Hôtel d'Alluye is nearly contemporary with Azay-le-Rideau, at least in the year of its commencement. The fronts on the court afford as good an example as can be given of the earliest French building in attempted imitation of the Italian manner. There can be no doubt that this front was completed between 1510 and 1516, and yet there is absolutely no direct reference to mediæval forms in the details. The general character of the arcades, which form the chief decorative feature, may be judged by the gallery of Bussy (Fig. 204). This, however, has the simple character of domestic building; for more elaborate architecture wholly non-Gothic in character, one must select such a piece of purely decorative work as the tomb of Louis XII. and his queen at Saint Denis. This indeed is a little later, not having been begun till 1516. The magnificent tomb in the cathedral of Rouen of the two cardinals George I. and George II., of Amboise, is indeed a complete work of the classical Renaissance, but it seems clear that it was not begun till 1520, nor finished till 1525.

We are perhaps right, then, in assuming the date 1520 for the complete victory of the Renaissance in France, although, as we have seen, some Gothic buildings were go-

ing on during another decade. It is certainly interesting to note that this is as nearly as possible a century later than the building of S. Lorenzo and the completion of the chapel of the Pazzi in Florence (see pp. 369, 370). It is a fact of enormous importance in the history of architecture that the Gothic art flourished in perfect strength and without the invasion of foreign elements for a century after Italy had taken up a revived classic style. It is also interesting to observe that the classical Renaissance was immediately successful in Italy, whereas in France it required forty years to make a beginning.

In 1526, Francis I. having been more than ten years on the throne, there was begun the great country Palace of Chambord, on the site of a hunting-lodge which the king had purchased. In this immense structure every detail is non-Gothic, and is in the main studied from Italian forms a half-century earlier in date (see Fig. 202). The plan and the general masses of the building are northern; that is to say, they are not Italian at all, and are the evident result of an attempt to modify the French strong castle of the fifteenth century so as to make of it an agreeable residence. This is true of the plans of the chateaux cited above (p. 391) and of many others; but in Chambord we know that the chateau was built from one design and at one time, under the direction of a French master-builder, and it is clear that the problem was studied not without much aid from experience gained in previous buildings. There is only one important piece of architecture built in the same style and either contemporary with or a few years earlier than

Chambord; namely, the building of Francis I., in the chateau of Blois.[1] The façade which fronts the court on the northwest side, with its open stairway tower, is very familiar to all lovers of picturesque architecture (see

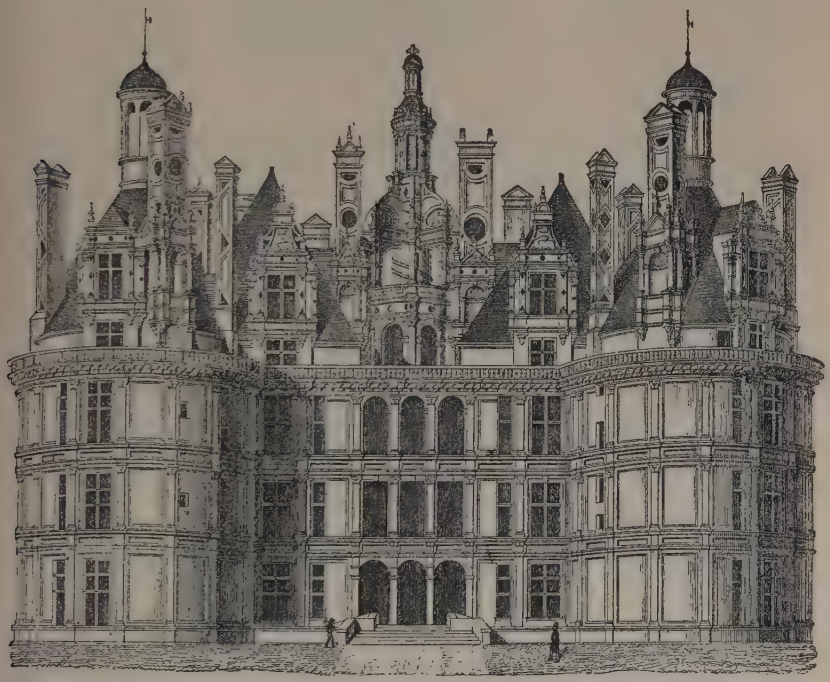


FIG. 202. Chateau de Chambord, France: Central mass. 1525 to 1540 A.D.

Fig. 203). The outside front of the same building, towering high above the town, is less known. This long front stretches about two hundred and twenty-five feet along

[1] The writer of the notice in the *Archives de la Commission des Monuments Historiques* notices that the emblems of Francis' queen, Claude of France, are absent from Chambord but common at Blois, and infers that the latter building was begun before her death in 1524.

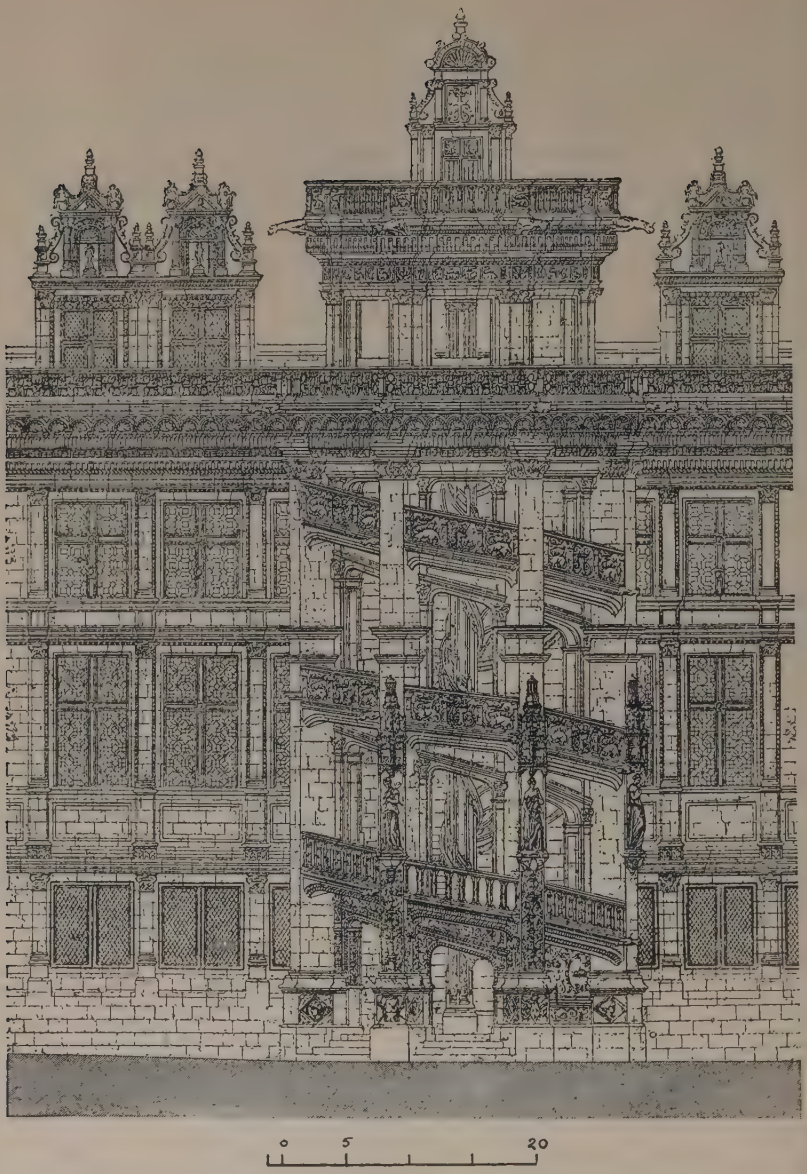


FIG. 203. Blois, France: Chateau. Part of the building of Francis I. About 1525 A.D.

one side of the square, from which rise the broken rocks which carry the chateau.

The two wings of the chateau of Bussy near the village of Bussy-le-Grand, in Burgundy, are of a simple and re-

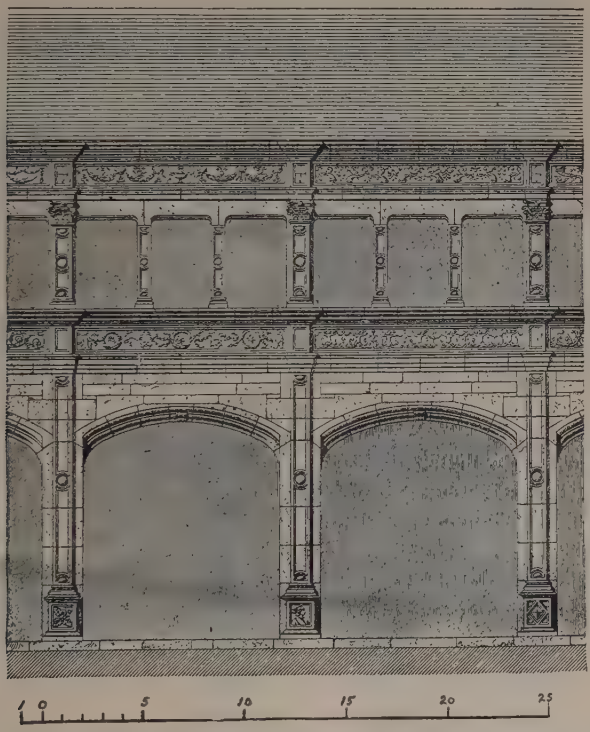


FIG. 204. Bussy-le-Grand, France: Chateau of Bussy-Rabutin. Arcade on the court. About 1540 A.D.

fined type of the architecture of Francis I. and show quite accurately the fashion in which French architects at this early date were dealing with their Italian models. Figure 204 gives one bay of this charming construction. Another and a much less pretentious architectural composition is

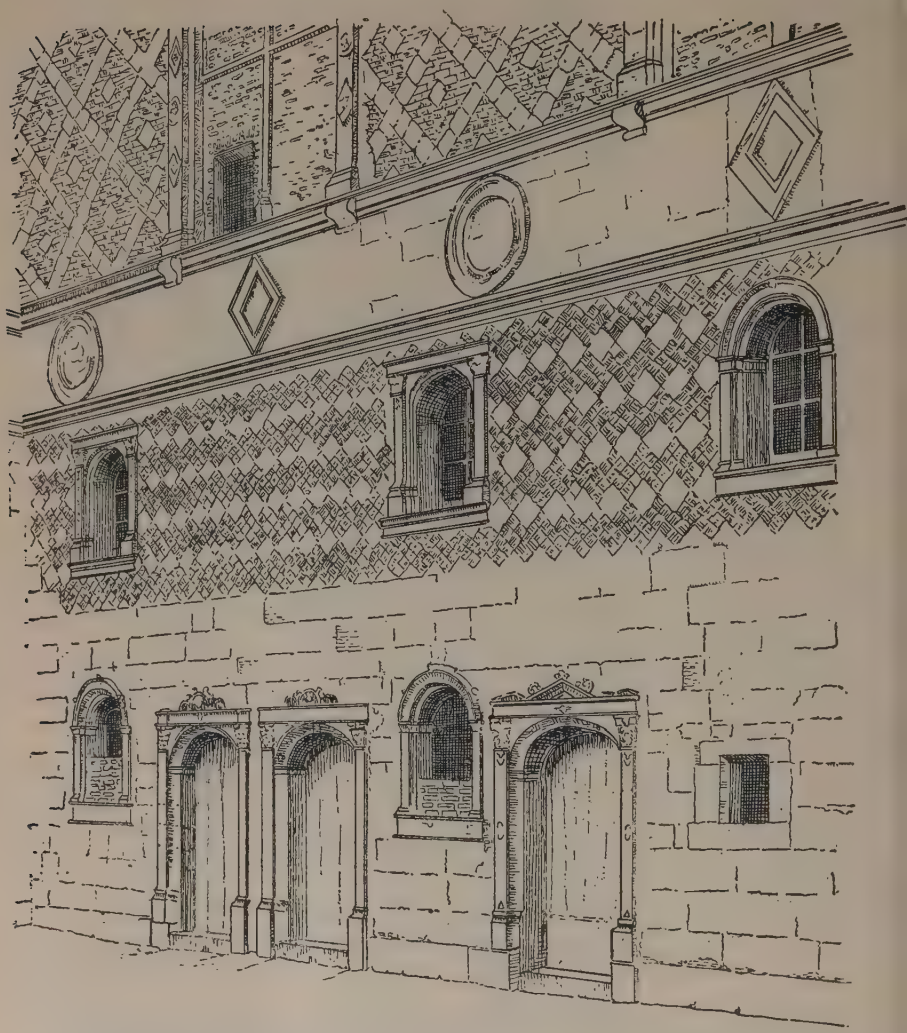


FIG. 205. Varengeville, France: Part of the manor of Jean Ango. About 1545.

offered us in the buildings at Warengeville, or Varengeville, near Dieppe on the Normandy coast. In this, which is commonly known as the Manoir d'Ango, from its builder,

a famous merchant of the time of Francis I., there is no pretence of stateliness or of that grandeur that comes of size and regularity. The buildings of a large farm are arranged around a courtyard, from which they are entered, and the enclosure itself is approached by a single gateway. This simple device for keeping out plunderers of hen-roosts, who on occasion might be capable of bolder enterprises, was in favour down to the revolution. The decorative details of Ango's buildings (see Fig. 205) are, to a large extent, obtained by the use of coloured materials, brick and light-coloured stone alternating in much the same way in which stone of two colours was used in the twelfth century (see p. 153).

It should be kept in mind that two tendencies are traceable, acting side by side and contemporaneously. In some buildings the form is somewhat Italian, while the details retain much florid Gothic feeling. In others, the form is almost wholly mediæval, while the details are non-Gothic. The best instance of the latter tendency is the church of S. Eustache in Paris. This church is unique in the completeness of its design as of a fifteenth-century florid Gothic church, all of whose details have been changed into something which is meant to be classical in the spirit of the Lombard Renaissance of 1475. The interior is beautiful in proportion and organization of its parts, and the detail is everywhere interesting. This church is one more instance of a fine architectural effect destined to have no farther result.

The beautiful wooden-framed houses of the sixteenth century deserve especial notice here, because in them more

than in the great chateaux is seen a mingling of Gothic and semi-classic feeling, the two styles uniting to form one. The house at Beauvais in rue S. Thomas, and another in rue S. Jean, are remarkable in this respect, and the house-front at Rouen on the square S. André (see Fig. 206) also exemplifies this action of the classic, or at least the non-Gothic, spirit upon builders who had themselves worked in the Gothic style and were still of a mind to retain all its freedom of design and of construction.

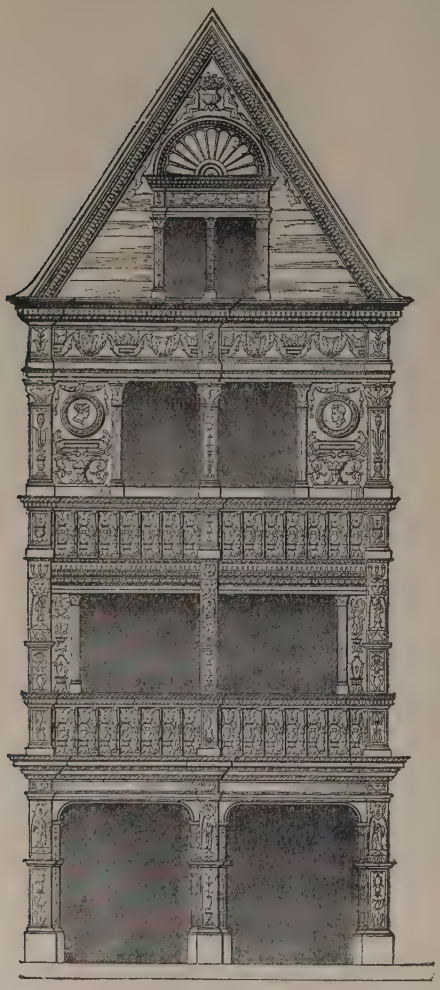


FIG. 206. Rouen, France: House. Middle of sixteenth century.

In complete contrast with these buildings is the chateau of Écouen. This palace consists of three buildings enclosing on three sides a square court whose fourth side was closed originally by a rich gallery with the gateway, now destroyed. It was built in the years following 1540 by the constable

FIG. 207. Écouen, France: Chateau. Begun about 1545.

Anne de Montmorenci and under the direction of Jean Bullant. The three fronts on the court are of three different designs, and each of these is in the main as purely a neo-classic design as an Italian building of the time. Two features only remind us that this is a building of the French Renaissance. One of these is the high roof with its large dormer windows (see Fig. 207, which gives a part of one of the fronts on the court). The other is the marking of the position of the chapel in one pavilion by its windows with pointed heads. It is evident that the windows are pointed that they may correspond with the curves of the vaulting ribs, which are of unusual size and projection, this tradition of the pure Gothic style having still so much weight whenever a vaulted roof was undertaken. The beautiful apsidal chapels of the church of Nogent-sur-Seine, near Troyes in Champagne, although later in date, form a curious contrast to the gravity of Écouen. In the exterior of these chapels, there are strong evidences of lingering mediæval feeling, and the result is curiously like the English Elizabethan style (see Fig. 208). The front of S. Étienne du Mont in Paris, begun about 1616, is an instance of a more advanced classical style compelled to adapt itself to the mediæval structure behind it (see Fig. 209). The late Gothic interior of this church is partly shown in Fig. 210, which gives the elaborate jubé or choir-screen, begun in 1600. The singular stone roof of the choir of the little church at Tillières (Eure) in Normandy, near Dreux, is a piece of bold designing. It consists of stone slabs laid horizontally upon stone ribs supported by arches (see Fig. 211).

FIG. 208. Nogent-sur-Seine, France: Church. Chapels of south aisle. Second half of sixteenth century.

Figure 212 is an approximate plan in which each diagonal line represents one horizontal rib together with the arch which supports it. Viollet-le-Duc names other roofs built in this way, but the system was not destined to survive.

Toward the close of the reign of Francis I., French architects became as widely known as the Italians of a century earlier or as those Italians whom the king had brought from Italy. These last had been in control at Fontainebleau. The first of them was Sebastiano Serlio, the well-known writer on architecture, who died at Fontainebleau in 1541. The painter Rosso Rossi, known in France as Le Roux or Maître Roux, and Francesco Primaticcio of Bologna continued the work at Fontainebleau, though more in the way of interior decoration than of architecture in the usual sense. The Frenchmen who succeeded them, and who surpassed them in achievement and renown, are especially the four architects, Jean Bullant, Pierre Lescot,

FIG. 209. Paris: Church of S. Étienne du Mont. West front. Close of sixteenth century. Portico. 1610 A.D.

Philibert de l'Orme, and Jacques Androuet du Cerceau, and the sculptor Jean Goujon. All five were born about the time of the accession of Francis I., and

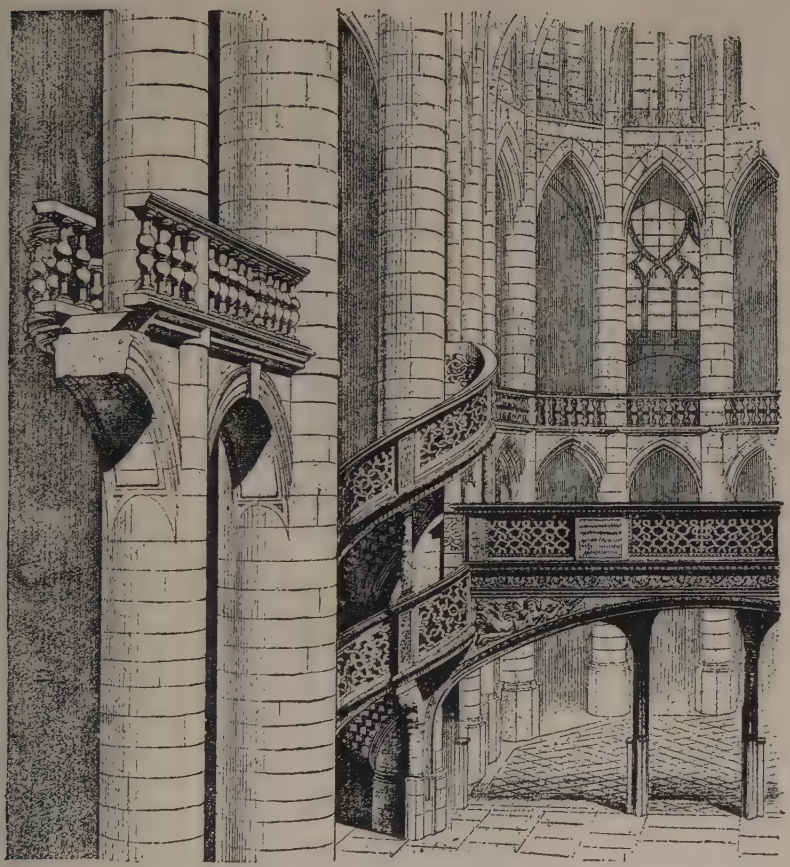


FIG. 210. Paris: Church of S. Étienne du Mont. Rood screen. Begun 1600 A.D.

although some of their work is included in the reign of that prince, yet all are to be considered rather as the artists of the brief reigns which followed. When Fran-

FIG. 211. Tillières, France: Church. Vaulting of choir. Second half of sixteenth century.

cis I. died, in 1547, the chateau of Écouen was complete, the new Louvre had been planned by Pierre Lescot and the buildings commenced, though the square court had not yet been increased to its present size; at Fontainebleau the buildings on the south side had been finished, and the so-called gallery of Francis I. was well advanced, and even the grave and severe court fronts of the Hôtel de Carnavalet at Paris had been completed from the designs of Pierre Lescot. The reign of Henry II. was marked by the erection of the beautiful belfries of the cathedral of Tours, though from designs of an earlier date, the chateau of Anet built for Diane de Poitiers, and the chateau of Villers-Cotterets. The tradition is that it was in the chapel of this last-named structure that Philibert de l'Orme first introduced those columns which seem to have bands around them, being built of drums of alternately larger and smaller size, — a detail which he was proud of and described in his books as "l'ordre française," and which was used freely afterward in the water-side gallery of the Louvre.

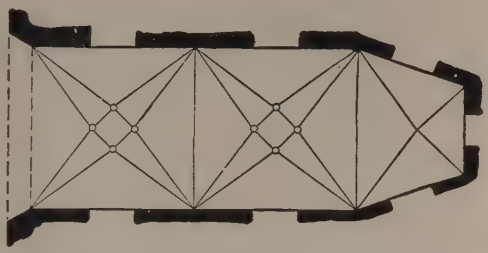


Fig. 212. Tillières, France: Church. Approximate plan of choir. See Fig. 211.

Soon after the death of her husband, Catherine dei Medici planned the construction of a palace outside the walls of Paris at a place called the Tuileries, from the tile furnaces thereabout. Philibert de l'Orme designed

a very large structure enclosing several courts and covering much of what is now the Place du Carrousel, where the triumphal arch stands; but only the western line of buildings was ever begun. Two years later, in 1566, Pierre Chambiges began to build that short stretch of building leading from the southwestern corner of the old Louvre southward toward the river, and which now has the Gallery of Apollo in its upper story. Only the ground story of this was built in the sixteenth century. The work on the old Louvre went on, and the square court was increased to four times its original size, so that the two fronts of Pierre Lescot became only halves of the western and southern façades respectively. These fronts of Pierre Lescot are held, rightly enough, to be the last works of the Renaissance proper in France.

With the reign of Henry IV. and the cessation of the religious wars a new style appears, a style of gravity and solidity and of a business-like economy of materials and workmanship, a style singularly devoid of the fantastic charm of Chambord and Blois; and also without that exquisite grace in the employment of the pseudo-classical details borrowed directly from Italian art of the second period, 1500 and later, which is to be found at the Louvre and at Écouen. Typical of the style of Henry IV. are the Place des Vosges, originally called Place Royale, in the far east of Paris, not far from the Bastille, and the Place Dauphine on the island in the river, and opening immediately upon the Pont Neuf, where Henry's equestrian statue is placed. Claude du Chatillon is the architect whom we credit with these designs. Enough remains

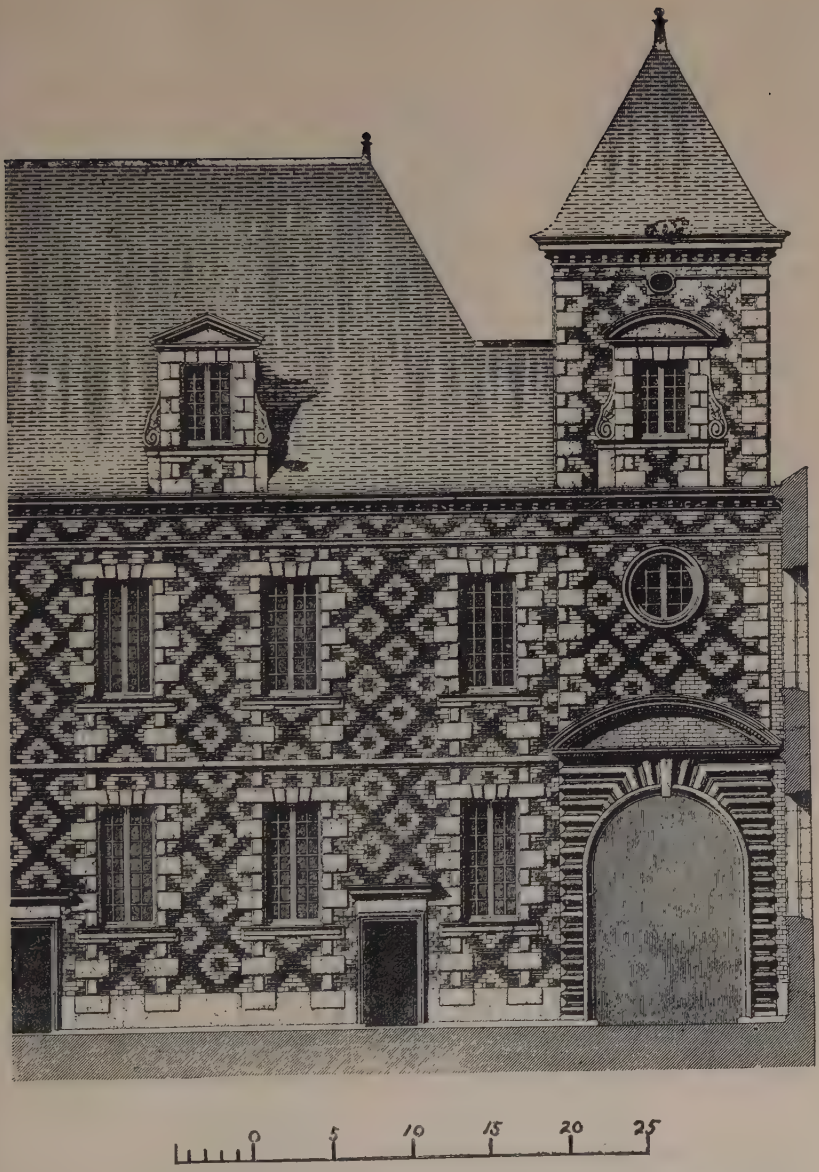


FIG. 213. Moulins, France: Former college of the Jesuits. First half of sixteenth century.

of the original buildings, even of the latter composition, to enable the whole to be restored in the mind, or (as has been done with success) on paper, as four long rows of similar house-fronts of brick and stone, well worked into simple and dignified architecture. Of the Place des Vosges much more remains intact; and the pavilion where the rue Birague enters the square is an admirable specimen of the earliest seventeenth-century town architecture. A good example of this class of buildings is the hospital of Moulins (Allier), once a Jesuit college, of which large building, Fig. 213 shows one wing. The Hôtel Montescot at Chartres is of this date, about 1610, and of the same gravity and simplicity of design. A far more decorative style was co-existent with what is described above; namely, that style of simple disposition and florid ornamentation embodied in the Hôtel de Voguë at Dijon and the Hôtel La Valette[1] opposite the island of S. Louis in Paris and fronting on the Quai S. Paul. In each of these buildings the same peculiarities exist: the almost complete rejection of colonnades and of the systematic use of classical orders in any form, even in the way of flat pilasters; the opening of windows in the walls simply and in sufficient number for convenience and comfort; and finally the investing of this simple exterior with abundant sculpture decoration. It marks the still existing independence of routine and tradition

[1] The recent restoration of this beautiful dwelling-house seems to have involved a very complete rebuilding, and it is difficult to be sure of the date of any part of the exterior work. Moreover, if the original were designed by François Mansart, it is later than the Hôtel Voguë.

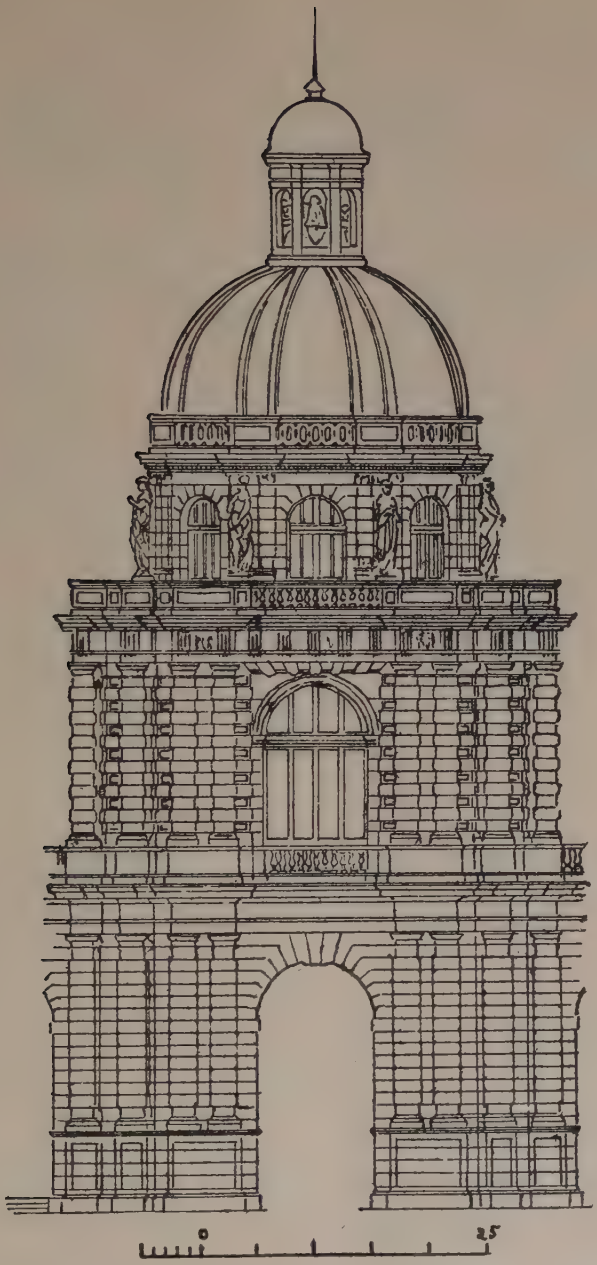


FIG. 214. Paris: Palace of the Luxembourg. Separate pavilion. About 1620 A.D.

in France that the Hôtel Voguë and the pavilions of the Place Royale should have been built simultaneously.

The reign of Louis XIII. is still marked by the erection of important private and civic buildings. The palace of the Luxembourg in Paris, built for the queen-mother Marie dei Medici by Salomon de Brosse, and the southernmost building of the Palais Royal, that which surrounds on three sides the square court opening on the Place du Palais Royal, which was designed by Jacques Lemercier for the Cardinal Richelieu, and now serves for the meetings of the Conseil d'État, are representative of the styles of this reign. The one embodies the severe and grave style of the time of Henry IV., modified by the introduction of orders of pilasters, but keeping these and all Italianized details in their place as decoration (see Fig. 214). The other exemplifies the commencement of that more self-conscious, more deliberately formal and stately style which was to reach its culmination under Louis XIV.

The churches of this reign (of Louis XIII.) are more numerous than those of the previous century; for, as time went on, the mediæval supply, abundant as it was, began to be found insufficient. Of them all, the church of the Sorbonne, begun in 1635 by Jacques Lemercier, is certainly the most important. Its dome is the earliest example in France of a stone dome carrying a stone lantern without any concealed devices for taking the weight; and its front in two orders is one of the best instances existing of the modern Roman system of design applied to the front of a building with clear-story and aisles. The west front of

S. Gervais had been built earlier than this, but was merely a front planted on to a church of earlier date. The church of the Val-de-Grace, in Paris, on the south side of the Seine, was built partly by François Mansart and partly by Jacques Lemercier; but the beautiful dome was not built until the time of Louis XIV., and is by another architect. The church of S. Roch, in Paris, is wholly of the reign of Louis XIV., and was designed by Lemercier, who had nearly finished the interior before his death in 1654. The curious system of vaulting alluded to in Chapter IV. and shown in Fig. 85 is well exemplified by the fine and impressive interior of S. Roch (see Fig. 215). At Fontainebleau Lemercier built, about 1634, the famous double perron in the oval court. At the Louvre the same architect was employed upon those two pavilions in the square court which made positive and certain the extension of the court to its present great size, 410 feet square in the interior. These pavilions are those of the middle of the south front and the middle of the west front. The original feudal castle had occupied a space not exceeding two hundred and fifty feet square, external measurement, and the new Louvre, as imagined by Francis I. and planned by Pierre Lescot, would have had an inner court not much exceeding one hundred and fifty feet each way. By adding a pavilion to the north of Lescot's west wing and one to the east of his south wing, and by making these the centres of the future west and south façades on the court, a court of four hundred feet each way was assured. These dimensions have been given because they mark the beginning of the modern demand for great size as a chief element in archi-

tectural effect. A mediæval cathedral was large, because a great deal of room was wanted on the floor, and the other dimensions had to conform to this, — following the inex-

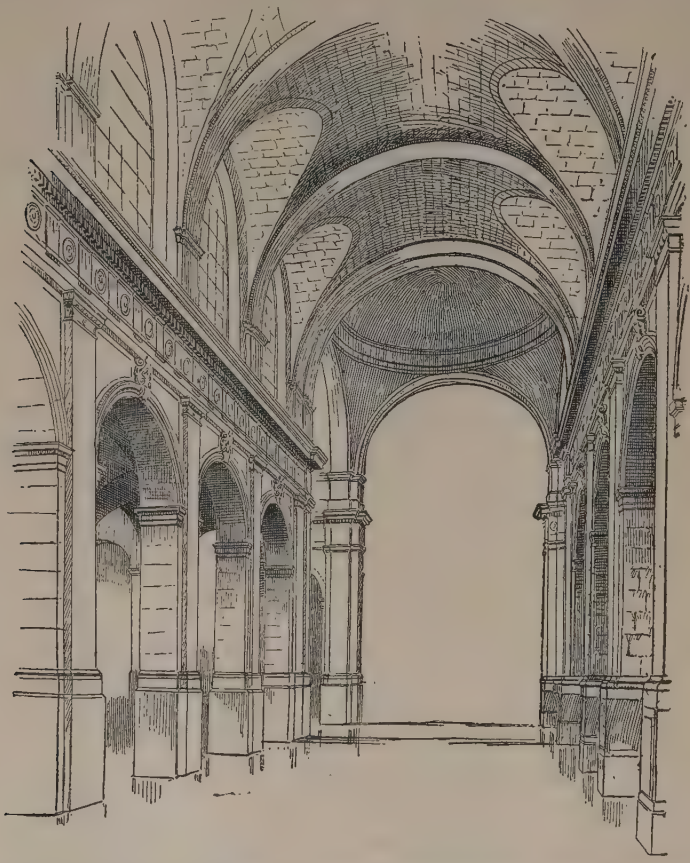


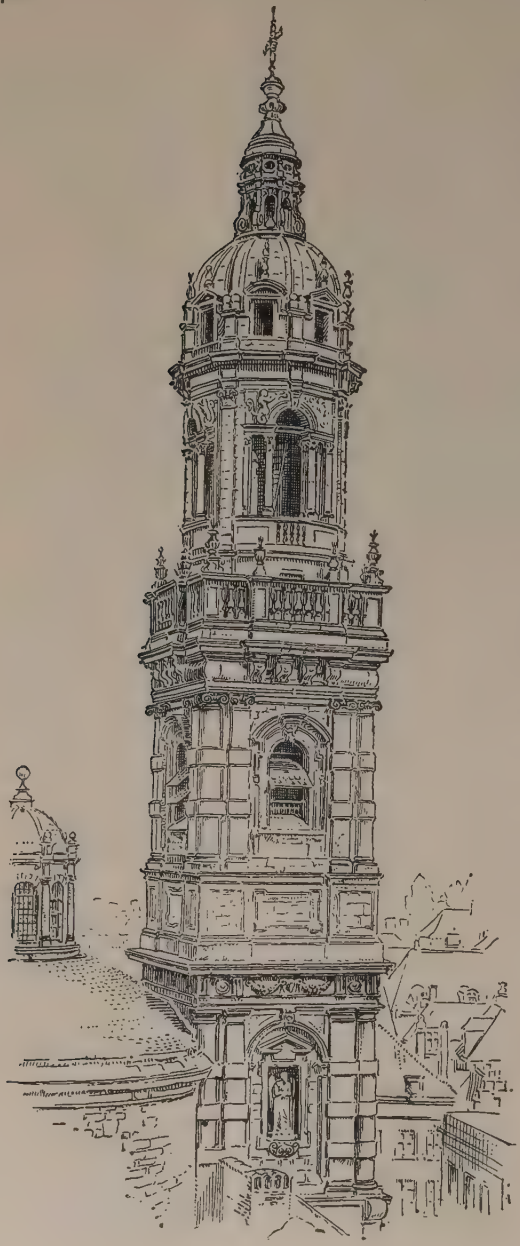
FIG. 215. Paris: Church of S. Roch. Interior of nave. About 1660 A.D.

orable logic of the style. The large building once obtained, no doubt the townspeople enjoyed its vastness; but they would hardly have spent their money for a building more than twice as large as they needed. In the case of

the Louvre, however, the future structure was at once much more than doubled in absolute cubic contents, and quadrupled in extent, with no obvious purpose but that of obtaining the grandeur thought to lie in great dimensions, or to be unattainable without them.

II

In the provinces lying north of France as ruled over by Francis I. and his successors, the florid Gothic style had as much tenacity of life as in France itself. In the year in which our present epoch begins, — two years later according to others, — the exquisite little Hôtel de Ville of Audenarde was begun, and this was finished about 1530. It is worthy to rank with the larger building of Louvain, described in Chapter VII. and shown in Plate VI., which, indeed, it strongly resembles both in general scheme and in detail. The Hôtel de Ville of Courtrai is of the same epoch. In this a very slight non-Gothic or anti-Gothic feeling appears; thus the arches of the windows are all semicircular. In the town hall of Ghent, built about 1530, a florid Gothic like that of Beauvais or Abbeville or the church of Brou is triumphant: there is yet no trace of classical feeling. The jubés or rood-screens of Belgian churches still retain the florid Gothic at later dates than these; that of Walcourt is dated 1531, that of Dixmude is probably of 1540, those of Lierre (S. Gummar) and Aerschot are ten years later in date, and that of Tessenderloo is known to be of 1580. Almost the first important building that can be fixed upon as of Renaissance design is the Hôtel de



Ville at Antwerp, begun in 1561 and finished in three or four years; a building thoroughly Italian in spirit, in intention, in the use of classical orders, in mouldings, in sculpture, rusticated basement, sequence of the orders above — even the cornice, — but strongly marked by that northern economy which forbids the stories to be much higher and the parts much larger than are needed. Somewhat the same spirit is visible in the chateaux of Blois and Chambord, and it is, of

FIG. 216. Antwerp, Belgium: Church of S. Charles Borromeo. Tower. About 1620 A.D.

course, supreme in the private dwellings of the time. The town hall at Antwerp shows it applied to a large civic building, and is a valuable study. The town hall of Hal near Brussels is of about 1615; its design is strongly suggestive of those buildings of the reign of Henry IV. spoken of in Section I. of this chapter, Place Royale and Place Dauphine. Figure 216 shows the little tower of the church of S. Charles Borromeo at Antwerp, erected soon after 1614. As a Jesuit church it is naturally laden with ornament in a somewhat indiscriminate way, but the composition of its main masses is well worthy of study.

In Spain, as has been shown in Chapter VII., an influence received directly from Italy was clearly visible at a time when in France there were but doubtful signs of it. This was natural because the florid Gothic, strong as was its hold on Spanish buildings, was still more at home in France; better organized, better understood, a more truly national style. Now, with the beginning of the epoch under consideration, a Renaissance style is found to exist, with much of direct Italian feeling in it, and much also of a picturesque and highly adorned style, which is hardly French of the time of Francis I., and hardly Lombard of the time of Bramante, but partakes of the nature of both. In one respect it is inferior to both, — in this, that it is uncontrolled and that its builders seem to have little sense of what may be done and of what must be avoided. Thus columns and pilasters are extended to excessive length, although side by side with others of reasonable and graceful proportion. It is not meant that the strict rules for

the proportions for the classical orders are violated,—those rules had hardly been laid down with authority in 1525,—but that pilasters having a height sixteen times their width are set up in immediate contrast with others only eight or nine times as high as they are wide, all supporting the same entablature. This solecism exists in the highly adorned front of S. Domingo at Salamanca. In the same town, in the courtyard of the Irish College, there are two arcades, of which the one on the ground story has engaged columns with shafts extended to ten times their diameter, while in the second story the place of columns is taken by candelabra much in the style of the French work of the time. In both these architectural compositions there is evident a fine sense of general proportion. The parts are well distributed; the fine massive tower which looks down upon the court of the Irish College, and is probably of the same date, is not more successful in its ponderous dignity than are the arcades below in their airy lightness; but the details, whether directly taken from Italy, or Italian with northern feeling in them, are misunderstood. The time has not yet come to consider Spanish Renaissance as a matured style. The artists of France were more competent to guard every design of theirs from barbarisms. Whether they admitted more or less Italian influence, they kept a firm hold on the members of their architectural composition. Many buildings of this epoch exist in Spain, however, which are without fault. The porticoes and arcades of the great courts of palaces are important, as is natural in a southern country. Figure 217 shows a detail of the Casa Polentina at Avila,

built about 1550. Two buildings exist in Salamanca, each of about the same date as the two mentioned on the last page, and each more successful than they as

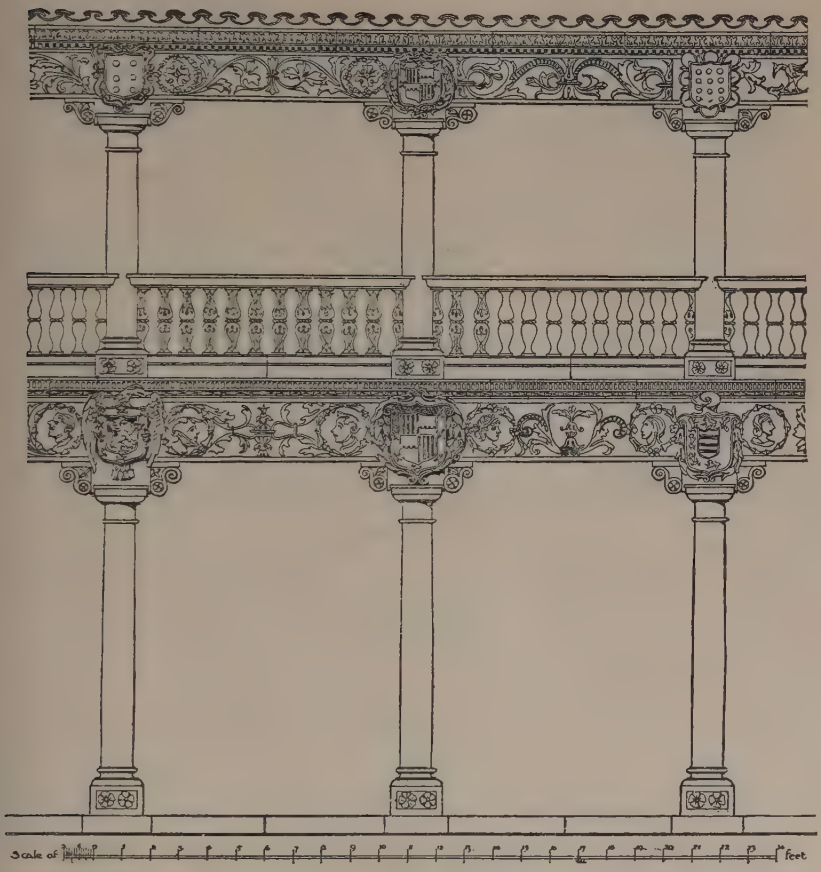


FIG. 217. Avila, Spain: Casa Polentina. Detail of court. About 1550 A.D.

a design. These are the cloister of S. Domingo and the porch of the University, both buildings of the Transition. In these the artist has shown all the Spanish power of

design in masses and has known how to invent or adopt architectural details to correspond. The porch of the University is an astonishing piece of decorative design. It must be considered as a further development of the decorative idea seen in S. Pablo of Valladolid, Plate VII. A large surface is covered with arabesque ornamentation mingled with medallions, heraldic shields, figure subjects in busts and full length; the whole distributed in panels divided by upright and horizontal architectural members, the scale of the ornament growing larger as the wall ascends. It is a triumphant piece of ornamental work, and none the worse for being not strictly accountable to the canons of any recognized style. The unfinished palace of Charles V. at Granada and adjoining the Alhambra is a noble piece of simple Renaissance, the work of Pedro Machuca, about 1530. Nothing can exceed the large unity of the design: a square of a little more than two hundred feet is occupied by a building of great simplicity of plan, enclosing a circular court about one hundred and ten feet in diameter. The stairways are in the corners outside of the circle. The exterior is but little broken by a projection in the middle of each front. It consists everywhere of one order of Ionic pilasters raised upon a high rusticated basement, except that at the centre pavilions the basement is decorated with a Doric order with coupled columns, and the upper story has coupled columns instead of pilasters (see Fig. 218). The court is of corresponding design, Doric and Ionic, and has an unusual air of tranquillity because of the total absence of arches, the Doric columns

carrying an entablature, and this the Ionic order above, which is similar in distribution. In this design there is

FIG. 218. Granada, Spain: Palace of Charles V. 1530 A.D.

no lack of harmony between the details and the general design; all has been perfectly felt and understood, and

nowhere in Europe is there a finer instance of the use of classical architectural forms put to modern use.

Of the same date is the Ayuntamiento, or town hall, of Seville, a building as peculiar in being covered thick with carved ornament as the Granada palace is in being free from it. It is a Renaissance design of that class which admits of arabesques in every pilaster, every frieze, every fronton, every architrave; turns columns into candelabra or carves their shafts, and tops the door-heads with statuettes of cherubs. In these respects this building is not unlike the front of S. Domingo at Salamanca, but it is very much better organized: it is a piece of matured style and not of experiment. The word *plateresco*, or silver-ware-like, made up from *platero*, a silversmith, as *Romanesco* is from *Romano*, has been applied to this florid Renaissance work of Spain;[1] it is not without charm, and the fanciful sculpture is well held in hand.

Much later than the above-named buildings is a splendid example of Transition style. This is the crossing of nave and transept in Burgos Cathedral: beautiful within, to any one who is not too much shocked by styles that are neither mediæval nor classical in their purity, and crowned by a *cimborio*, or central tower, of surprising picturesqueness and vigour. All of this is later than 1539, when the old work fell, — it is said to be as late as 1560, — and it is not surprising to find classical details used in many parts of it: what is surprising is the suc-

[1] The term is loosely used, at least by non-Spanish writers, and is applied to designs of the sixteenth century which are merely bad, that is, immature, and with details awkwardly combined.

cessful use of such seemingly incongruous elements in one composition. Only about a decade later is the Escorial (1563–1584, according to the usual chronology), and in this the most severe and chilling uniformity prevails. The interior of the church, or chapel of the palace, which was also a conventual church in a sense, and a building of a very considerable size and importance, is of a surprising dignity; it is worthy of study in this, that it looks even larger than it is. In the cloister the vaulting of cut stone is exposed undecorated and uncoloured; it is extremely curious to see groined vaulting, such, at least in form, as the ignorant ninth-century masons used, with its transverse arches, wall-arches, and lunettes complete but executed in neatly cut blocks. One cannot but feel that classical Roman practice on the one hand, or Gothic building with ribs on the other, would have been a great deal cheaper. Ignorance of what the Roman method was, and contempt for the Gothic method because it was Gothic, make up together the secret of this apparent departure from natural and easy methods.

The seventeenth century in Spain is not a brilliant architectural epoch. In general the somewhat florid variety of earlier times, which calls upon the archæologist to seek carefully for its derivation and cause, has passed into most chilling monotony; or, if traces of the old facile ingenuity remain, these are found in the most incongruous and unsightly masses used as substitutes for Roman orders. Of the few exceptions there may be mentioned the buildings at Santiago de Compostela, which adjoin the west front of the cathedral, and are devoted to the Chap-

ter and its Library. It is very curious to see in these last-named the Renaissance feeling so strongly manifested after a lapse of two hundred years, and also to note that independence of Italian example which was so common with the earlier and better work, though now combined with the poor detail of the seventeenth century. The artist in charge of the work must have been a man of great natural powers to have got so easily the singular grace of proportion seen in the west towers and the sombre dignity of the library buildings adjoining.

III

The strange thing which we call the German Renaissance cannot be rightly judged by those who insist on comparing it with its Italian prototype, or its French, Spanish, and Belgian congeners. The student must study this curiously simple and yet picturesque architecture by and for itself. The buildings are almost always small in their parts, inexpensive in their construction, cheap and simple in their material. The mediæval feeling for high-ridged and pointed roofs, for dormer windows, turrets crowned with spires, belfries, balconies, and a general tendency toward beetling and overhanging fronts, was still present. So far from diminishing, this tendency toward picturesqueness of treatment may even be thought to have grown stronger in the sixteenth century. The use of pseudo-classical details, and even of columns and pedestals fairly well copied from Italian models, in no way interferes with or hinders the free development of this unruly and

unrestrained designing. A few critically accurate Italianized designs are to be found, but they form a sharp contrast with the vast majority of structures of their own time. To form a true conception of the German Renaissance, one should visit, perhaps, Rothenburg on the Tauber, on the extreme western boundary of Bavaria. Here the little town seems, except for the alterations around the railway station, unaltered since the Thirty Years' War. From the low walls one looks out over the green country, where no modern suburbs break the sweep of the fields up to the very ditch, leaving the ramparts as defensible as ever, — once the embrasures repaired, — against seventeenth-century means of attack. Within the walls, the streets are not very narrow nor very winding, but they are what they have always been. The town seems not to have been crowded, nor to have tended to outgrow the limits of the fortifications. There are no Gothic buildings except parts of the churches in the town, nor any modern ones, — or so, at least, the student will think. The whole place is now as it was in the seventeenth century, public and private buildings alike. The extremely interesting Rathhaus is dated 1572–1590. Its design would seem to be of a half-century earlier but that one learns from experience how slowly decided modifications of style appear in this long period of Transition. In the neighbouring town of Dinkelsbuehl are some timber houses, finer than anything in Rothenburg, where, indeed, the masons had it all their own way. The house called "The German House" (Deutsches Haus), in Dinkelsbuehl, has four stories in its gable and three in the wall below. The timber construc-

tion is complicated, with many braces and struts put in for ornamental purpose, and the patterns made by these are Gothic in character. On the other hand, all the chief parts of the framing, such as the uprights and horizontals of the windows and those which form the main structure of the gable, considered as one truss of the roof, project boldly; and these are carved into terminal figures, pilasters filled with arabesques, and entablatures worked with classical mouldings. Such timber-framed houses as this are very common, and their dates are frequently easy to fix. The one we have described is undoubtedly of 1542, and a later restoration has not disguised or confused the character of the earlier work. At Halberstadt are some superb wooden houses of 1550. Hildesheim, near Hanover, is perhaps the richest town in fine wooden-framed houses (see Fig. 219). They are very numerous there, and the house of the Butchers' Guild is a marvel of decorative effectiveness. This last has been restored recently, with all its original colouring carefully reproduced; and it is as important as a piece of architectural colour as it is in form and construction. At Duderstadt, near Göttingen, the Rathhaus is dated 1528. It is entirely of timber construction above the stone basement, and is an excellent type of the larger and more important buildings of the time when built chiefly of wood. In this instance, three octagonal turrets adorn the front, two of them carried on stone corbeling and one on a fantastic semi-Gothic shaft, all of which stone-work forms part of the design of the basement. These turrets are covered with tiling, the walls as well as the spires, above the line whence the gables spring,

while all their projecting oriel-window-like stories below are combined with the visible framing of the walls in one design. In this way the line where the gables begin is

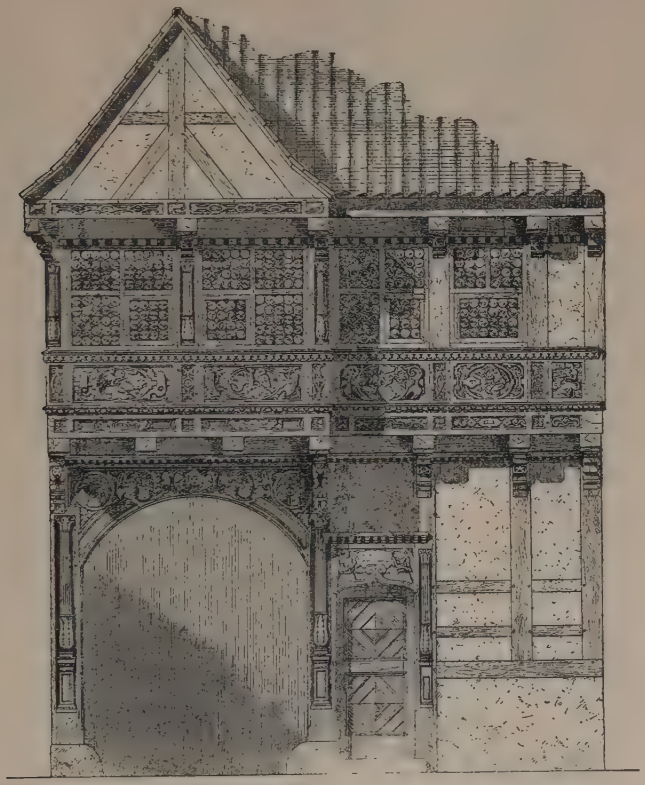


Fig. 219. Hildesheim, Germany: Wooden framed house. Close of sixteenth century.

emphasized in the strongest way, and the whole design is divided into three well-marked bands. It may be thought that some classical feeling is shown in this insistence upon the horizontal line; it is certainly a feeling less familiar in German Gothic than is to be wished, and in so far the

Italian influence may be considered beneficial. At Danzig, on the Baltic Sea, there are many houses of the years 1550–1570, some of which are of great beauty, and which group admirably in long-continued façades on the streets, as in the Langgasse and in the Langemarkt. The houses are all of masonry, and have a certain character of stateliness and elegance, united with the picturesque effect produced by their long rows of gables of varying form and the somewhat extravagant nature of many of their details. The house No. 38 of the Langgasse is indeed distinguished by two entablatures of Roman Doric style, and by a frieze of sculpture which has been studied from good Italian work of about 1500; but these three pieces are used merely as sill-courses for the large windows of the front, and have an appearance of support from corbels carved with human heads. The door-piece is, however, of formal Italian design, with Doric columns and entablature. The house adjoining, No. 37, is adorned with pilasters to which a semblance of Doric, Ionic, and Corinthian style has been given; and these pilasters support entablatures of that curious sort in which the frieze is increased to three or four times its normal width, and charged with sculpture, but also divided into panels by a sort of prolongation of the pilasters below. Each of these houses has a gable of irregular outline, made up of concave and convex curves; the one is dated 1563 and the other 1567. They are typical of long rows of houses in this and other streets. Contrasting with these is a stately mansion of about the same date, in which four stories of fairly regular order are crowned by a gable most skilfully combined, as

to design, with the formal front below. This is a very noble house, and the sculpture, which is used with great reserve and only where much needed, is fine and well

Fig. 220. Danzig, Germany: Zeughaus or Arsenal. About 1605 A.D.

modelled. The Zeughaus, a kind of arsenal of the town, is of 1610, and reminds one curiously of the buildings of Henry IV. in France, though having so much more of the irregular, and in this case excessive, oddity of detail. Figure 220 gives a part of one of the fronts of this curious

structure, built of brick, with quoins and other details of stone. Over all the city towers the really beautiful spire of the Rathhaus of the Rechtstadt, built about 1560, and worthily crowning the building of an earlier date, which with the spire is entirely of brick. Churches and public and private buildings vie with one another to make this city, far away on the borders of Poland, one of the most interesting in Europe for buildings where a certain independence of academic rules has resulted fortunately for the picturesque effect of separate buildings, groups of buildings, and whole quarters of the town. On the other hand, there are buildings which affect the not unpleasing formality, as if in advance, of the eighteenth century; and one of the gates, the Langgasserthor, is a Roman triumphal arch in distribution, adorned with free columns in two orders, carrying *ressauts* of great boldness. The Rathhaus of Cologne, built between 1569 and 1571, is an example of systematized neo-classic architecture, comparable to the *Hôtel de Ville* of Antwerp (see p. 418). The very graceful portico of two stories is given in Fig. 221. Of a later date is the interesting Rathhaus of Ratisbon, in Bavaria, of which a part is given in Fig. 222. The severity of design in this forms a curious contrast to the lack of restraint seen in so many of the buildings of the time. The important church of S. Michael at Munich (1582–90) is built with a groined vault, resembling that of S. Roch, given in Fig. 215, except that the minor arches of the lunettes are lower, and leave the great barrel-vault almost unbroken (see Fig. 223). The fine interior is marred by an order and a system of roof-decoration immeasurably inferior to

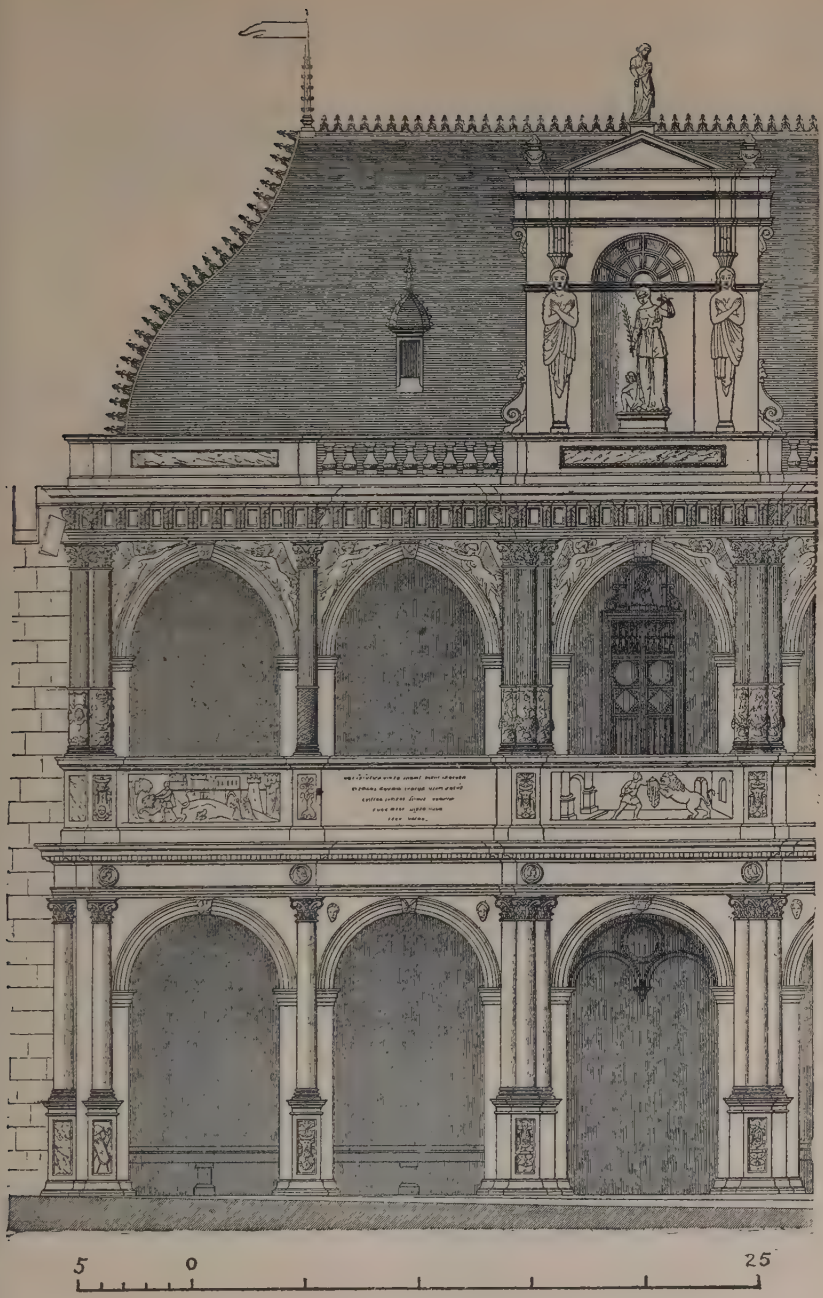


FIG. 221. Cologne, Germany: Entrance porch of Rathhaus. About 1570 A.D.

the corresponding details of S. Roch. On the other hand, the main masses are combined in the most logical way. Exterior and interior are strictly in harmony, and the

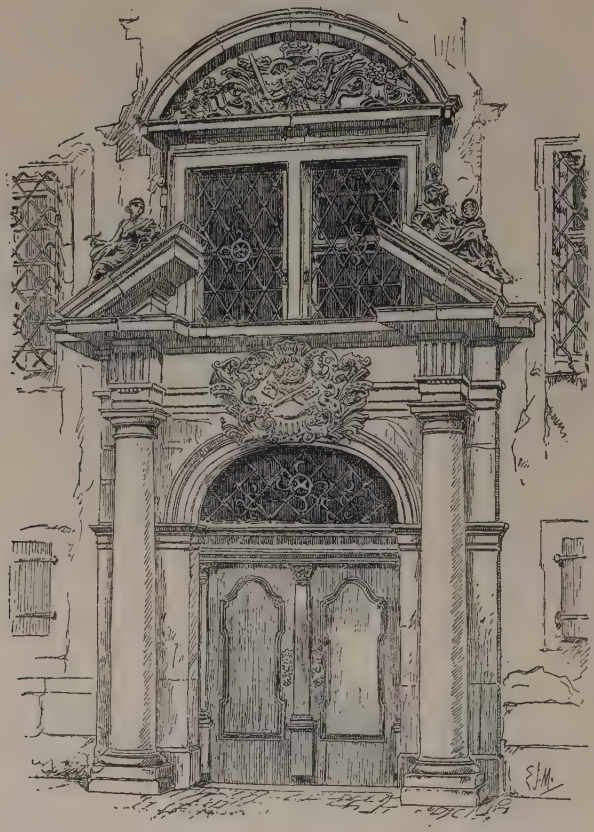


FIG. 222. Ratisbon, Germany: Door of the Rathhaus. About 1662 A.D.

severe front is adorned with portrait-statues of the time, which are wonderfully appropriate and helpful to the design.

The well-known buildings of Heidelberg Castle, "Otto

Heinrichs-Bau" of 1556, and "Friedrichs-Bau" of 1601, are excellent types of the German Renaissance of their time;

FIG. 223. Munich, Germany: Church of S. Michael. Interior of nave. 1585 A.D.

and of the same date is the admirable house in the town, the inn whose sign is The Knight, "Zum Ritter." One of the most curious instances of decorative architecture in

Europe is certainly the north front of the Friedrichs-Bau, where the architect of the Count Palatine has tried to make a large front both formal and fantastic, — at once academic and picturesque. He has drawn inspiration from Venetian palaces, Roman churches, and the earlier efforts of his fellow-countrymen, and has produced a mixture which must be classed as very bad architecture, its undoubtedly spirited effect coming from the play of light and shade on its long succession of sharp-edged masses, as if upon a natural cliff.

A curious contrast to these over-picturesque buildings, crowded with details which belong to no recognized style and seem to have had no development, but to have sprung ready made from a restless brain, are those chateaux (Schloesser) so frequent in the remoter parts of Germany which have almost no architectural detail at all. Every traveller in central and southern Germany will remember these huge whitewashed buildings rising from the hilltops; there is one of them of 1550 at Fuessen in Bavaria, and one of 1650 at Hoernitz near Zittau, on the Bohemian frontier; but indeed they are numerous in Germany and in Austria-Hungary as well. They are high-walled and high-roofed, crowned with turrets and bell-gables; their lofty buildings are arranged around courtyards, which are finally enclosed by high walls; in fact, they are the regular descendants of the strong castles of the Middle Ages, and those who have visited the Wartburg to see the Luther relics can form from that much older building a sufficient idea of the seventeenth-century country mansions which are under consideration. The strong tendency toward

picturesque effect, which is characteristic of German work at all times, and which leads to fine results in the two centuries before 1665, is well seen in these wholly unadorned and, in a sense, unarchitectural groups of building.

IV

The epoch of one hundred and forty-five years now under consideration covers English history as follows: some years of Henry VIII., the disturbed and brief royalties of Edward VI. and of Mary, the comparatively quiet reigns of Elizabeth and of James I., together with fifteen years of Charles I., these three making up a time of change, growth, and, on the whole, natural and healthy progress in architecture; and finally the disturbed time of the civil war, the Commonwealth, and five years of the Restoration. It is evident, therefore, that political circumstances encouraged building during only those eighty years which form the middle of the longer epoch. During those years, what was known as the Tudor style was superseded rather abruptly by the Elizabethan architecture, and this was continued by what has been called the Jacobean style; the reign of Charles I. was marked by serious attempts to introduce the completed and regulated Italian architecture, but these succeeded only in part, and the Great Rebellion closed this era of transition. In 1666 the great fire of London, coming only five years after the restoration of Charles II., marks well enough the beginning, under Wren, of the unquestioned supremacy of Italian methods of

design, and the beginning of the later epoch treated in Chapter IX.

At no time during this long period was Gothic feeling absent. It holds with even greater persistence than in France its position as an independent style, and influences even more than in Germany the transitional architecture which was growing up. Henry VII.'s chapel, mentioned in the last chapter, was succeeded by such buildings as the hall of Christ Church at Oxford, in which four-centred arches are used for the windows, which are filled with perpendicular tracery, and the beautiful wooden roof has the same form of the flattened or depressed pointed arch for the controlling lines of its design. This building has no single classical feature, although it was finished about 1530, and was therefore one hundred years later than the establishment of the Renaissance architecture in Italy. Haddon Hall, in Derbyshire, the favourite place of resort for visitors interested in the picturesqueness of the Transition architecture, was brought to its present shape, in the main, about 1540. It was added to and altered in the years following, but its long lines of building, one story high above a basement, varied by projecting bay windows both square and polygonal, their openings filled with a system of mullions and transoms, low towers rising at intervals, and the wall everywhere fringed with square battlements, which form the sky-line, as no roof is visible: all this makes up a perfect example of the Tudor domestic architecture, passing into the earliest Elizabethan. As late as 1555, S. John's College at Oxford shows in its garden-front almost exactly that Tudor-

Gothic style described in Chapter VII. The four-centred arches have passed into three-centred arches in a part of the work; battlements crown the low wall; the roof is rather steeper than usual, and this in England means an early style far more than on the continent. Some classical sculpture there is upon the oriel-windows, and the corbels which carry them are neo-classic in character, but all this is so late in style that it clearly belongs to nearly the same epoch as the doorway to the garden and the alterations made by Inigo Jones. Such classical details as these, if of the same time as the building proper, would have to be classified with the tombs, many of which exist in English churches of Italian or French Renaissance design, and of an earlier date than the Oxford College. These tombs are of course by continental artists, sometimes brought to England by their employers, and sometimes sending their finished work. Just as in Germany, the classical orders, or some semblance of them, were used in porches of buildings which otherwise knew no such foreign elements of design, so these tombs were easy to bring under the influence of Italian or Franco-Italian art, while manor-houses and churches remained in the hands of native builders.

What is called the Elizabethan is one of the most curious transition styles known in European history. It is like the Tudor style of the reigns of Henry VII. and Henry VIII., except that every detail which might have a Gothic look is taken out, and scraps of classical detail are put in their places, but timidly and with reserve. There is in consequence a lack of detail in the earliest

examples; thus the so-called Duke's House near Bradford-on-Avon in Wiltshire is a small mansion-house with gables and picturesque chimneys, and with the walls break-

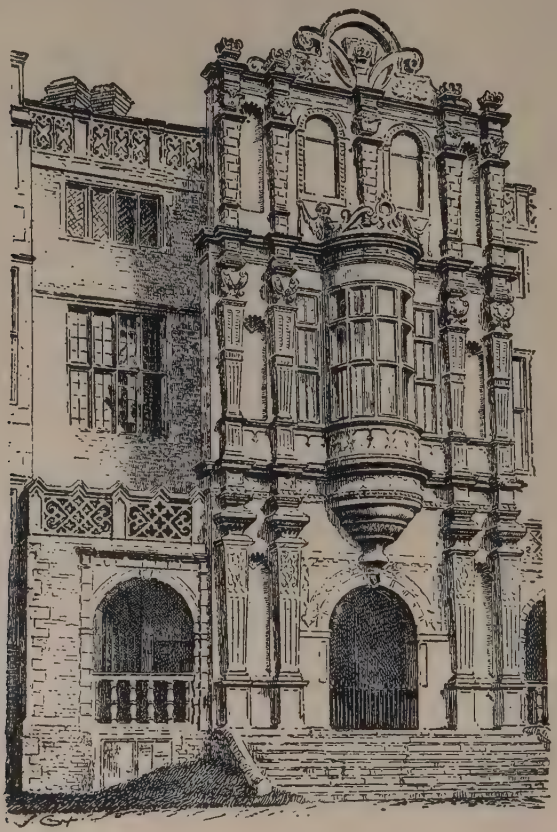


FIG. 224. Bramshill manor-house, England: Detail of front. 1609 A.D.

ing out in numerous bay windows. These bay windows and the flat walls are alike pierced with as many mullioned windows as they can hold, and the building is picturesque and attractive when seen from a little dis-

tance, but it is so devoid of ornament that it seems bare on a nearer view. There is no doubt that this building is of about 1567, or in other words of the second decade of Elizabeth's reign. The system described is well shown in the house of Bramshill, Surrey (Fig. 224), although this is of somewhat later date. A much larger manor-house is the great mansion of Longleat in Wiltshire. In this palace there is no visible roof, and of course no gables, but the wall is pierced with windows and broken up with bay windows, and those windows are filled with the stone bars, mullions, and transoms which superseded Gothic tracery; — in short all below the sky-line is treated in as picturesque a manner as in the Duke's House itself. The difference is in the somewhat freer introduction of flat pilasters, one order to each story; but only on the bay windows, which are emphasized in this way; and in the use of columns and an entablature in the small and unpretending porch. The huge palace of Wollaton Hall in Nottinghamshire was built shortly after 1580, and this has as many windows as Longleat, as picturesque a breaking-up of its walls, and an even more mediæval outline and grouping. On the other hand, it has pilasters and entablatures used more freely than at Longleat. What is especially of importance in our enquiry at Wollaton, is the free introduction of that peculiar Elizabethan ornament which consists largely of scrolls and cartouches, and ignores alike the beauty of Gothic and that of Renaissance sculpture. Figure 225 gives one of the four angle towers of Wollaton. Certainly this system of ornamentation cannot be praised, but, as an insep-

arable part of the Elizabethan architecture, which has many virtues of its own, these straps and scrolls are accepted without disfavour. Such manor-houses as those named were built all over England about this time. The great nobles were replacing their feudal fortresses by country houses of more habitable character, exactly as was being done on the continent. Burleigh House, near Stamford in Lincolnshire, was built in 1577; Wollaton in 1590; Longford Castle in Wiltshire in 1591; Cobham Hall in Kent, 1594–99; Hardwich Hall in Derbyshire, about 1597; Ingestre Hall in Staffordshire, about 1601; Montacute House, in Somersetshire, about 1610; and Hatfield House, in Herefordshire, at the same time. All these are "Elizabethan," that is, they are not at all classical in their general conception: they are mediæval buildings with Gothic details left out, and with a good deal of

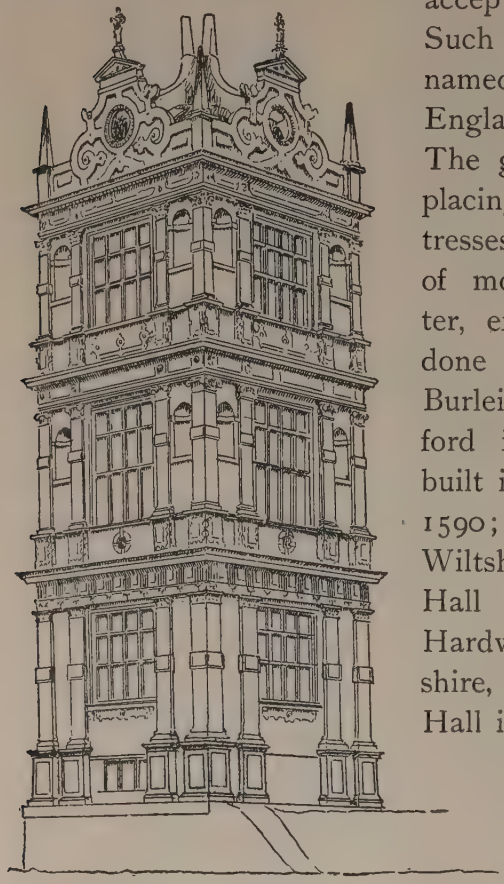


FIG. 225. Wollaton Hall, England: Angle tower. 1590 A.D.

hesitation visible in every part as to what should be put in its place. This is well illustrated by the doorway of Gainford Hall in Durham County, shown in Fig. 226. A comparison of this with the details of Italian buildings of any date following 1420 will show the completely non-traditional character of the classic details employed. In these buildings there is a great diversity in the amount and character of the classical architecture introduced, and this is visible as much in the general design as in the details. There is no unanimity, no general acceptance of a style which all may follow. Thus at Longford Castle, the celebrated entrance-front has a centrepiece with arcades about fifty feet wide; the arcade on the ground floor has four-centred arches of a Tudor appearance, springing directly from the capitals of what are meant for Roman Doric columns; on the floor above, the arcade is so far classical that the columns are between the arches and carry their own entablature, while the arches themselves are semicircular and spring from Roman imposts, but all the minor details are as non-Roman as possible. Other parts of this front are almost German in their mingling of pilasters of fantastic and non-classical form with terminal figures, and the crowning of the whole with gables of curved outline. The other fronts of this house are Tudor in style, without admixture.

Of a later date than any of those named above is Rushton Hall, Northamptonshire; for this, though begun in 1595, was not finished till 1630, and yet seems to be of the same design throughout. In plan it is stately and like a great French chateau, the main building surrounding three

FIG. 226. Gainford Hall, England: Entrance doorway. About 1600 A.D.

sides of a court, which is closed on the fourth side by a one-story structure with a terrace roof, in which the principal entrance is marked by a somewhat decorative archway. This entrance-front is entirely characteristic of the whole structure; no part of it is more classical than this or has more to say of an influence from Italy coming directly or by way of France. Blickling Hall, Norfolkshire, though finished earlier than Rushton, had been begun much later; it was built complete during the two or three years immediately preceding the accession of Charles I. It is a Tudor building throughout, built of brick, with stone copings, bay windows, window architraves, and quoins; entirely picturesque and non-classic in treatment, and absolutely without any use of the Roman orders or their imitations, except at the main door of entrance. Ashton Hall, at Birmingham, is of the same date and the same character. The words used above to describe Blickling will serve for Ashton also.

All the above are mansions of stone and brick built with considerable regard to stateliness of effect, as stateliness was understood in England and in the country, where the conditions were of course different from those of a city square in Rome or Paris. Contemporary with them are numerous half-timbered houses, in which stateliness is non-existent, and a certain homeliness replaces it which is most agreeable to the modern lover of home. These half-timbered buildings are built with frames of solid oak sticks, put together with mortise-and-tenon joints, and wooden pins to hold the tenons. The square and triangular spaces left open between the posts, ties, and braces

are then filled with mason-work of some kind, which is brought to a smooth surface flush with the face of the timber-work. Such a building is Bramhall in Cheshire, with a long row of gables on the garden-front. Another, and a very celebrated one, is Moreton Old Hall, Cheshire, the gable walls of which irregular structure are built overhanging in two or three stages, and whose timber framing is even more irregular and unsymmetrical than that of Bramhall. Figure 227 gives a part of the garden-front of Moreton, showing large bay windows, of which each face is topped by a gable and is filled with glazed sash. Still another, and a somewhat more carefully planned and built, example is Park Hall near Whittington in Cheshire. In the city itself of Chester are buildings, dwelling-houses, and shops built of the same materials and in the same manner, some of them of the years 1600 to 1660, though many of them are earlier. There is no difference in the matter of elegance and cost of construction between these houses of citizens and the mansions of country gentlemen which have been described. In all there is the same marked simplicity, the same domestic and unpretending appearance, as of cottages built for quiet living, and in all there is to be noted the same absence of any architectural style. The stone and brick-and-stone mansions are either Perpendicular Gothic, or Tudor, or Elizabethan, or Jacobean; even if displaying a mixture of styles, as is natural in a period of transition, they tell the beholder what style or styles they affect. But the half-timbered houses are neither Gothic nor post-Gothic in character: the fifteenth-century and the seventeenth-century examples can hardly

FIG. 227. Moreton Old Hall, England. Garden-front. About 1590.

be distinguished; or not distinguished at all but by small details, as of carved ornament around a porch or a hip-knob. This simple and in a sense rustic aspect of the timber-framed houses, as contrasted with the more grandiose air of such houses as Bramshill and Wollaton, has given rise to the theory that the native Englishman, of mingled British and Saxon race, is represented in the one, and the Norman in the other class of mansion. This is perhaps impossible to demonstrate or to maintain seriously, but at all events the one class of house may be taken to represent the stay-at-home land-owner, and the other the court noble, who went up to London annually and met foreigners, if indeed he did not follow the wars abroad. Both classes of houses represent native English habits of building in superintendents and workmen alike, and in this they are different from the buildings which professed architects were desirous of building when they could obtain a royal or princely patron. Inigo Jones, a Welshman, who had had unusual opportunities of foreign study, and who had extraordinary powers of design, recommended himself to the nobility in the first place as a decorator and scene painter and organizer of masques; and at last, when he was fifty years old, made it seem to some of his patrons desirable to carry out a part of his stately designs in the Italian taste. About 1620 what is called the Banqueting House at Whitehall, but which is used as the Royal Chapel, a stately front, not large but of great dignity of design, facing the Horse Guards, was erected; the only part ever built of an immense palace designed to please King Charles I. This building is one hundred and

ten feet long by fifty-five high, and consists of a basement with square windows upon which are raised two orders of almost exactly the same size and crowned with a high parapet. The two orders correspond with two rows of square windows, but there is only one story in the building. The Banqueting House formed only one member of a very long front, and the drawings that have been preserved make it clear that Inigo Jones' intention was to keep his orders of the same height throughout, and to make his entabiatures continuous. Nearly all designs in the developed neo-classic style of the seventeenth century — the Italian or Palladian style, as it is commonly called in England — presuppose a perfect uniformity, in the exterior, without regard to the size or distribution of the rooms within. Inigo Jones was one of the most skilful of designers, as his less pretentious decorative work shows, but it is clear that he was too devoted an adherent of pseudo-classic principles to modify a great classic front for such considerations as differences of one or two stories within. In this instance, as clearly as in any other, is seen the willing abandonment by the architects of the seventeenth century of all naturalism of design and a hearty adoption of the theory that architecture was an art that could be mastered only by acquiring and mastering settled rules of proportion. Whatever the rooms within might be, size or shape or purpose, the exterior must not be made to correspond with them further than that the designer was free to choose between a certain number of formal dispositions of the exterior parts.

At the same time with the Banqueting House, Jones built in London the row of houses on the western side of Lincoln's Inn Fields: a long front, forming one single design of great beauty in the severe style adopted. A single order of pilasters rests upon a moderately high basement, and between the pilasters are two stories of windows. Of the style followed here there must be some account given in the next section, for these novelties of the "colossal order" and its concomitants were a hundred years old in Italy when they first appeared in England. A design simpler in being without the large order of pilasters, but in other respects as formal as the above-named buildings, is the south front of Brympton House, Somersetshire. Ten years later, about 1630, Jones built the very beautiful Corinthian portico at the west end of S. Paul's Cathedral; but this structure is known to us only by means of prints of the time, for it was destroyed, together with the church, in the great fire of 1666. York Gate, which still stands in London on the embankment near Charing Cross Station, is all that remains of the buildings of the Duke of Buckingham, George Villiers, the favourite of James I. and his son Charles. This lovely portal was the watergate of York House.

V

At the beginning of the present epoch, the work of the Italian architects was still very much diversified. Some of them still clung to the traditions of the Renaissance. Nearly all were trying to reach a different result, that

is to say, the nearest approach to Roman antiquity; but each was working along his own lines of approach. Thus at Mantua the Palazzo Tè was undertaken in 1525, under the direction of Giulio Romano. The interior details, the columns, pilasters, entablatures, and vaulting of the great vestibule, or "atrium," are excessively clumsy in design; too short, too low, too heavy for a palace interior, and the Roman order is abandoned in many points; but with this is united an extraordinary richness of sculpture and painted ornament. Above the necking of the columns and pilasters almost every raised or prominent part of the surface is covered with architectural sculpture, scrolls, wave-lines, guilloches, and anthemions, and all the sunken panels are filled with painting. In the walls below there are statues in niches, and large and small panels filled with figure sculpture in relief. It would not be strictly accurate to call this the architecture of a painter, — it is rather the designing of a man without a delicate sense for form and for proportion, and one who thought that an appearance of antique massiveness was to be got by being clumsy, and that clumsiness could be redeemed by decoration. A somewhat similar attempt to be classical, without any shrewd sense of what was fine in classical art, is to be found in the garden-front of the same building. It is to be remembered, however, in awarding praise and blame to buildings which are accredited to a single architect, as becomes the custom in dealing with the sixteenth and following centuries, that nothing is so hard to be certain of as the authorship of a large and complex architectural design. It is as difficult in the nineteenth century as

it was in the sixteenth to give credit for a design to any one person. The general sketch is made by the master, and the details are worked out and the whole design brought into shape, perhaps, by his pupils and assistants. But no admirer is able to learn who deserves the credit for what he admires. Was the force of the design in the original sketch, or was this as much of a hindrance as a help to those who completed the studies? It is not therefore with unhesitating blame that we can lay the serious defects of this very inferior work of the later Italian Renaissance to the charge of Giulio Romano.

A few miles to the north, Verona, a city in which architectural art has always been marked by purity and refinement, buildings of extraordinary dignity were erected during the years 1530–1550, this rare virtue being achieved by the simplest means. The Palazzo Pompei has a front on the street of less than eighty feet. This front consists of a high basement very plainly rusticated and pierced with round-arched openings, and a single story in which round-headed windows are alternated with the columns of a Roman Doric order rather strictly treated. The piers at the two ends are larger than the others, and in the upper story these are fronted with a column and a square pilaster of equal projection. The delicate look of the upper story, with its rather widely spaced slender and fluted columns, is, in a singular way, enhanced by the shutting in of this row of columns between the square and solid vertical masses of the two pilasters, although these are not larger in width or projection in any part than the width of the shafts at their base. Minute touches are added to give

lightness above and ponderous mass below; thus the sills of the basement windows are of the full thickness of a course of stone, and are not divided into mouldings or horizontal lines in any way, but have their projection supported by deep corbels cut into plain ogee curves, as if an intention to make consoles of them had been abandoned. The courses of stone are deeply rusticated, and the surface is roughly treated with the pointing chisel, so as to leave it uniformly vertical but still full of irregularities, like those of uncut blocks. This type of palace was created, it may almost be said, by Bramante, as in his design for Raphael's house on the Piazza Rusticucci at Rome, now destroyed. It is, however, preserved and developed by Sammichele; for, although buildings with a high and massive basement and a single richer story above had been built in Rome and elsewhere (see the close of Chapter VII. and Fig. 201), the palaces of the North offer many interesting varieties of this design, and Sammichele, who died in 1558, is the great master of the style. After his death, it was carried on in the Palazzo Bevilacqua, which was built from his designs. This is a building far more ornate, and with the front pierced with much larger openings. The windows of the principal story are alternately very large and much smaller, and the columns between them are brought together in pairs, with a small window between the columns of each pair; the basement also is broken up with pilasters, — a fatal modification. Much dignity is lost, and only a doubtful advantage gained for external architecture by this development of the style in the direction of greater variety. It is pleasant to note

that, forty years later, the simple design of the Palazzo Pompei was closely followed, and on a much larger scale, in the splendid building which is set against the ancient wall of Theodoric, on the southwestern side of the Piazza Bra. This beautiful building is now a corn market. It is called the Gran' Guardia Antica, and is ascribed to a little-known architect, Andrea Milano. The design differs from that of the Palazzo Pompei in having unfluted coupled columns, and in minor details. It is also on a much larger scale, having fifteen bays instead of seven in its façade, and having its central portion crowned by a low attic. There is no city in Italy in which street architecture has been more successfully treated in the neo-classic style than Verona.

In Venice, however, the refinement of Verona, or something nearly akin to it, is joined to a splendour and richness of composition unapproached in the less wealthy and splendid city. The Libreria Vecchia or Old Library of S. Mark designed by Sansovino was begun in 1536, and more than half of the front on the Piazzetta and opposite the Ducal Palace was finished by him. At the same time the Zecca or Mint, immediately behind the Library and fronting on the sea, was built by the same architect. The Mint is a simple and workmanlike building with an exterior in two stories above the basement, each story treated by itself. The basement is rusticated and pierced with round arches like the basement of the Roman and Veronese palaces which have been mentioned above (pp. 387, 452, and 453). The principal story is then in the Doric order with square windows, and the uppermost story in the

Ionic order with square windows crowned with pediments. The columns and pilasters of this front are banded, but not

FIG. 228. Venice, Italy: Palace Widman. Detail of front. Close of sixteenth century.

with the elaborateness shown in the buildings of the French Renaissance and succeeding styles.[1] The cornice

[1] For this banding, see Fig. 228, a part of the palace Widman, in Venice, probably of this epoch.

of the Ionic order is carried on a row of corbels, which is substituted for the proper frieze of the order so that this may serve for the wall-cornice. It is hard to imagine a more satisfactory building for civil or domestic purposes in a style where variety is avoided and ornament forbidden. The beauty of the Renaissance is not in it, but a new beauty all its own belongs to this later and severer style. The interior court of the Zecca has its walls pierced with much larger openings, it is more elaborate, and, indeed, the principal story is reduced to a light Roman order with slender pilasters substituted for the engaged columns. In contrast with this simple building is the superb Library which adjoins it (already named), a building which has been called often enough the finest thing of its time. Its front on the Piazzetta (see Plate IX.) and the smaller front on the sea consist alike of a lower Roman order with Doric columns and an upper one with Ionic columns, and nothing else except a parapet with statues; but every part is treated with unusual elaboration. In the ground story, the engaged column and its two adjoining imposts are reduced to four feet four in width, on the façade, and the openings between these piers, which are all open arches, are not quite twice the width, or about eight feet three. There is therefore not much more than room on each side of the engaged column for the moulded archivolt which springs from the impost, and there is a very small spandrel. The Doric cornice is unusually large, and is complete with its triglyphs. In the story above, the Ionic columns are raised upon pedestals, and the impost upon each side is much broader

PLATE IX. LIBRERIA VECCHIA, OR OLD LIBRARY OF S. MARK, VENICE

Part of front on the Piazzetta, Built about 1536.

than below, and comprises a free Ionic column under the impost, — these smaller columns being also raised on pedestals to a height a little above that of the larger pedestals. In this way the piers of the upper story are made very much wider than those below, wider indeed than the windows which alternate with them; and the spandrels are large in proportion. The frieze of the Ionic order is increased to a width of more than three feet clear, and the decorated mouldings above it broaden it still more, thus making of the entablature a very sufficient crowning feature. So far, there has been described a building of elaborate character, and one embodying many subtilties of design in the smaller Ionic columns, which have their shafts fluted and reeded to contrast with the larger columns of the order, and which, as their capitals are set much lower than the capitals of the larger columns, have their bases properly raised higher than the larger bases. The mouldings are all extremely sharp and delicate. The proportions are of extraordinary refinement. All this beautiful front is covered thick with sculpture arranged and combined with the most elaborate care. The smaller spandrels of the lower arcade are filled with nude male figures in high relief; the Doric frieze above them is filled with flat conventional carving, which would be dull enough in another place but serves a good purpose here as a foil. The larger spandrels above are filled with draped and winged female figures, the plumes and drapery disposed to fill much of the space, which, moreover, is in part concealed by the elaborately sculptured Ionic capital, whose very volutes are filled with foliage.

The keystones of both arcades are sculptured, — lion heads and human heads alternating. The broad terminal frieze contains small ventilation openings treated like tablets, and included in a composition of festoons, figures, heads, and scrolls, which crowd every part of the surface. The pedestals of the parapet carry statues of very considerable merit. One is reminded that the author of this unrivalled front was a sculptor of the highest rank in his day; a man whose work, though admittedly of the Decadence, is still to be taken very seriously even in its large and independent pieces. Not one of the sculptures which he placed during his lifetime in connection with his buildings, — the giants of the Giant Staircase, the S. James in the cathedral of Florence, the statue over the door of S. Giuliano in Venice, the bronze doors of S. Mark's, — not one but calls for the study and admiration of later times; and the sculptured enrichments of this library are as unique in their value as is the delicate and refined architecture which surrounds them. Conventional architectural carving is freely used to set off this expressional sculpture. The Doric capitals are of the richest design, and correspond to the elaborate Ionic columns described above. The delicate mouldings of the archivolts are plain below, but are enriched in the upper story. The tablets which enclose the openings in the great frieze are worked in the same way, and are enlarged by foliated scroll-work. The offsets in the architrave above, and the mouldings of the dentil course and cornice, and the modillions, are carved as the regulations ordain, but with unusual delicacy.

The effect of elaborate sculpture upon a front is not sufficiently weighed by modern students. Those who have the opportunity to see a modern Gothic front in England, or a modern classic front in Paris, before and again after its carving has been executed, should note this important point. The mechanical and copied sculpture of many nineteenth-century buildings has caused a certain reaction in some quarters in favour of design which shall be wholly independent of carving. This Venetian front of 1536 may join with the French portals of three hundred years before to declare that a building with sculpture belongs to a different and better class than a building without it.

There is another curious consideration which this front brings up, its probable superiority to anything which the imperial Roman world had seen. It is difficult to believe that any design made by an architect of the time of Augustus or of the time of Hadrian could equal this one. It must be remembered that the free and perfect application of sculpture to architecture is of the Middle Ages and not of antiquity, so far as we know. In this sixteenth-century work we have a piece of abstract designing probably superior in refinement to anything which the imperial architects could produce, and adorned with sculpture which is far superior to that which we know as having been applied to the exteriors of Roman buildings, which sculpture, moreover, is applied to its purpose of adornment with a sense of fitness coming of the great traditions of four hundred years.

Venice was the home of splendid architecture at this

time, and public and private buildings vie with one another in the somewhat artificial and self-conscious excellences of a highly taught school. The Logetta, at the foot of the great bell-tower of S. Mark's, is by the same Jacopo Sansovino who built the Library, and is of 1540. The huge and stately Palazzo Cornaro, called *Corner della Ca' Grande*, on the right as one ascends the great canal; the splendid front of the Scuola di S. Rocco; the Palazzo Malipiero-Trevisan behind S. Maria Formosa; the Palazzo Corner-Mocenigo at San Polo; and most important of all, the Palazzo Grimani at San Luca which was the post-office thirty years ago and is now occupied by the Court of Appeals, — a building with one of the most dignified fronts ever imagined by a neo-classic architect, — are all of this time. The front of the Scuola di S. Rocco, built about 1536, is shown in Fig. 229. It is a belated piece of Renaissance designing, but as fine as the buildings of the prime. A number of churches should also be named, such as S. Giorgio dei Grechi, S. Maria Mater Domini, S. Giuliano, S. Fantino; and also those which Palladio designed, such as S. Giorgio Maggiore, the Redentore on the Giudecca, the front of S. Pietro in Castello, and finally S. Francesco della Vigna.

For Palladio, however, and the curious influence which he exerted on the architecture of the century following his death, especially in England, one must go to Vicenza, where the arcaded porticoes of the so-called Basilica, the Palazzo Chieregati, the Palazzo Thiene, and others, embody what seems to have been his theory, that

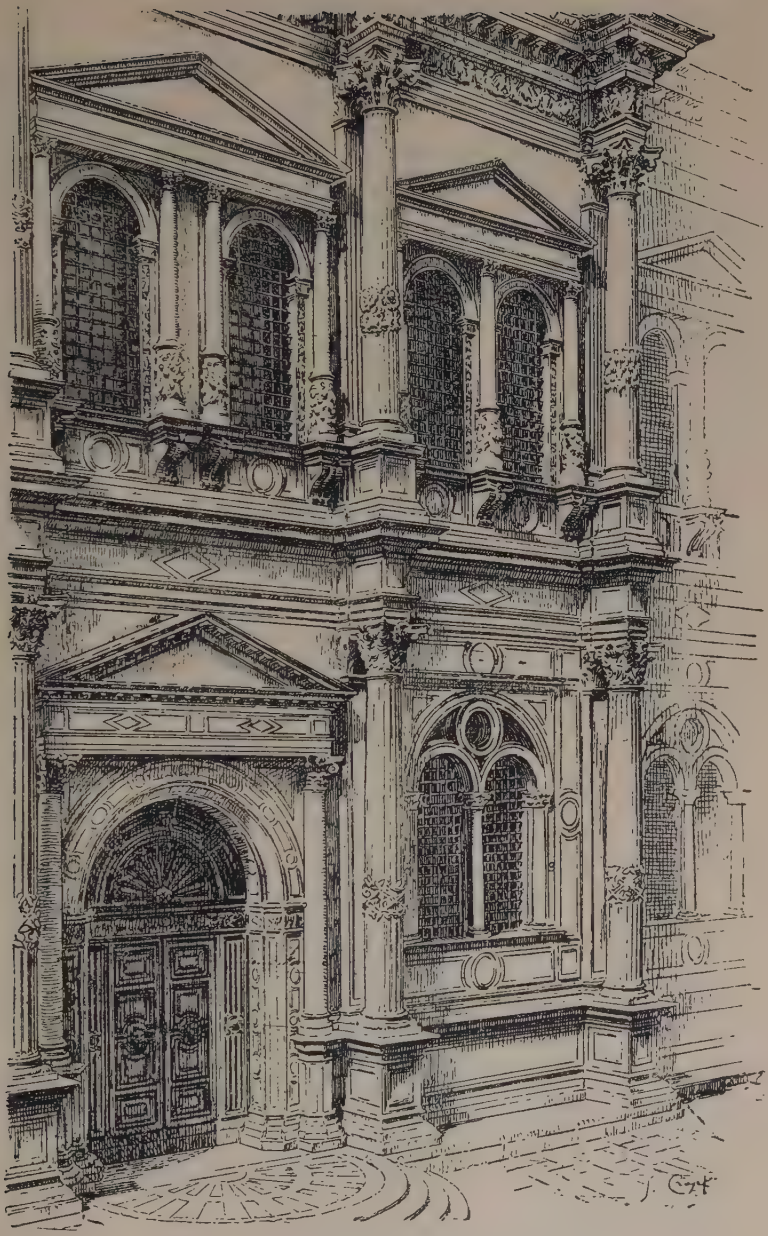


FIG. 229. Venice, Italy: Scuola di S. Rocco. Detail of front. 1536 A.D.

architecture is an abstract thing existing independently of excellence or poverty of material, of fitness or unfitness for the needs of the building, of massiveness or slightness of build, of great or diminutive size. It is impossible not to recognize the beauty of the Palazzo Thiene: both its exterior (see Fig. 230), and its great court offer to the student admirable models of the right use of large masses and simple details; but its architecture is a mere stucco casting with a rough brick core, and nothing but the problem of laying out his masses has concerned the designer at all. It is model-making, not architecture. It is scenic designing, as when temporary triumphal arches are put up on a day of festivity, and not architecture. The fronts of churches such as S. Francesco della Vigna are criticised in the very guide-books, as not agreeing with the interior; but this, after all, is a small fault, as the chief lighting of the interior is easily provided, and the building is a simple hall which any front may be thought to suit: it is a common fault, too, and all Italy joined with Palladio in building its church-fronts as it pleased. The front of S. Francesco della Vigna, that of the Redentore, and that, so well known, of S. Giorgio Maggiore, seen on its island across the broad canal of Saint Mark, are at least of solid masonry, and the pilasters, with their capitals, are cut out of marble or Istrian stone, not modelled in stucco on a brick backing. There is also a difficulty overcome, and a serious one, in fronting these nave-and-aisle churches which are to have but one central door and no windows at all in the front, being, indeed, better as to interior effect without light from the front. It is easy to

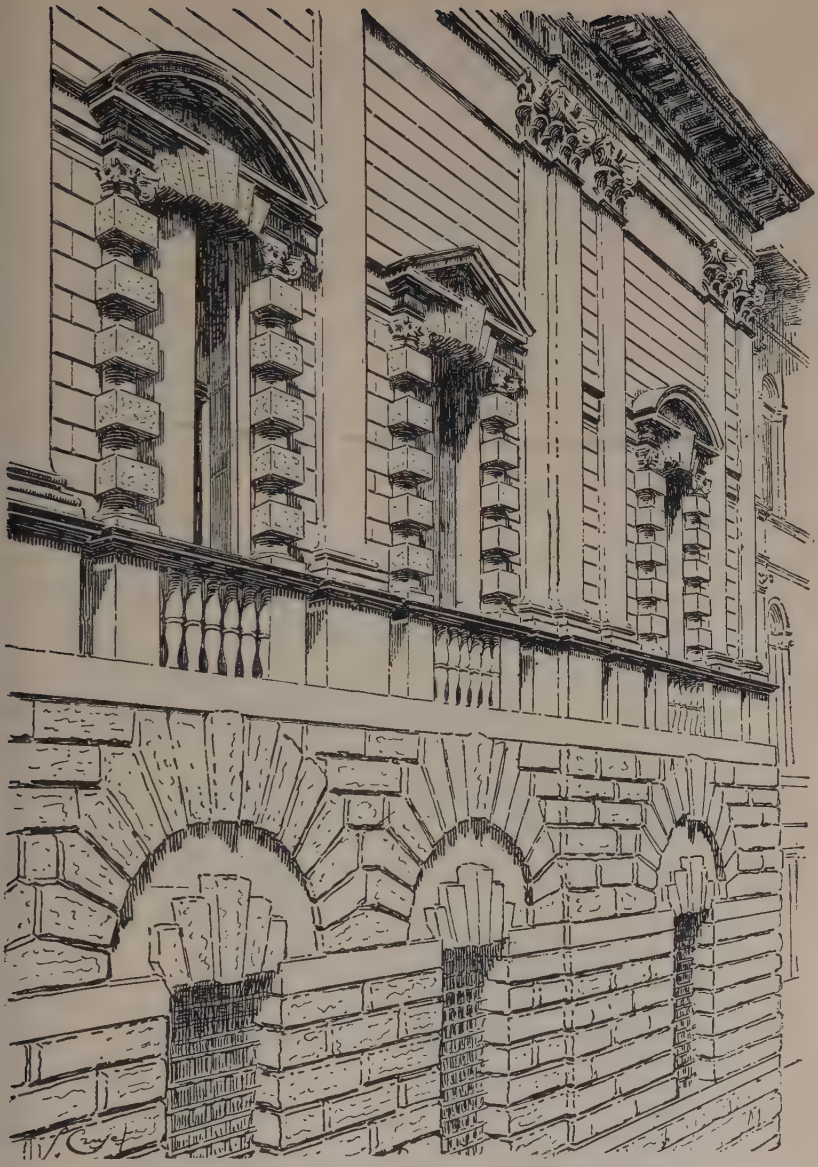


FIG. 230. Vicenza, Italy: Palazzo Thiene. About 1556.

ridicule these arbitrary assemblages of pilasters on high pedestals and pilasters on a low stylobate, as in S. Giorgio Maggiore, the entablature of the lower order being cut right through in four places by the higher and larger pilasters; but it is a logical working out of the Roman theory, and can be defended. The varied aspect in which a church presents itself to the eye, the flanks as important as the front, and the chancel end even more worthy of attention; the interior, moreover, carrying it over the exterior always and everywhere, and open to all comers, — all this prevented the Palladian doctrine of repression and ascetic self-denial in architecture from being too harmful in church building. It is the matter of domestic and civic buildings, where every amateur found all the supposed needed rules plainly laid down and easy of comprehension, and architecture was made a plaything, a mere matter of setting out fronts as children put together dissected maps, — it is in this that the Palladian school worked its mischief, more in the North than in Italy. The celebrated Villa Rotonda near Vicenza (Fig. 230 A) is an instance of the simple Palladian recipe applied to domestic buildings. In such designing as this, a delicate sense of proportion is all that is needed: there is nothing to deter the amateur from trying his hand at it, — neither the difficulties of construction nor the needed mastery of sculpture, nor even the labour of planning skilfully. This is Palladianism. In Italy it was restrained by the example of the richer schools contemporary with it: Palladio could not rule supreme when Sansovino, Scamozzi, Sammichele, and Scarpagnino were at work in the North, his

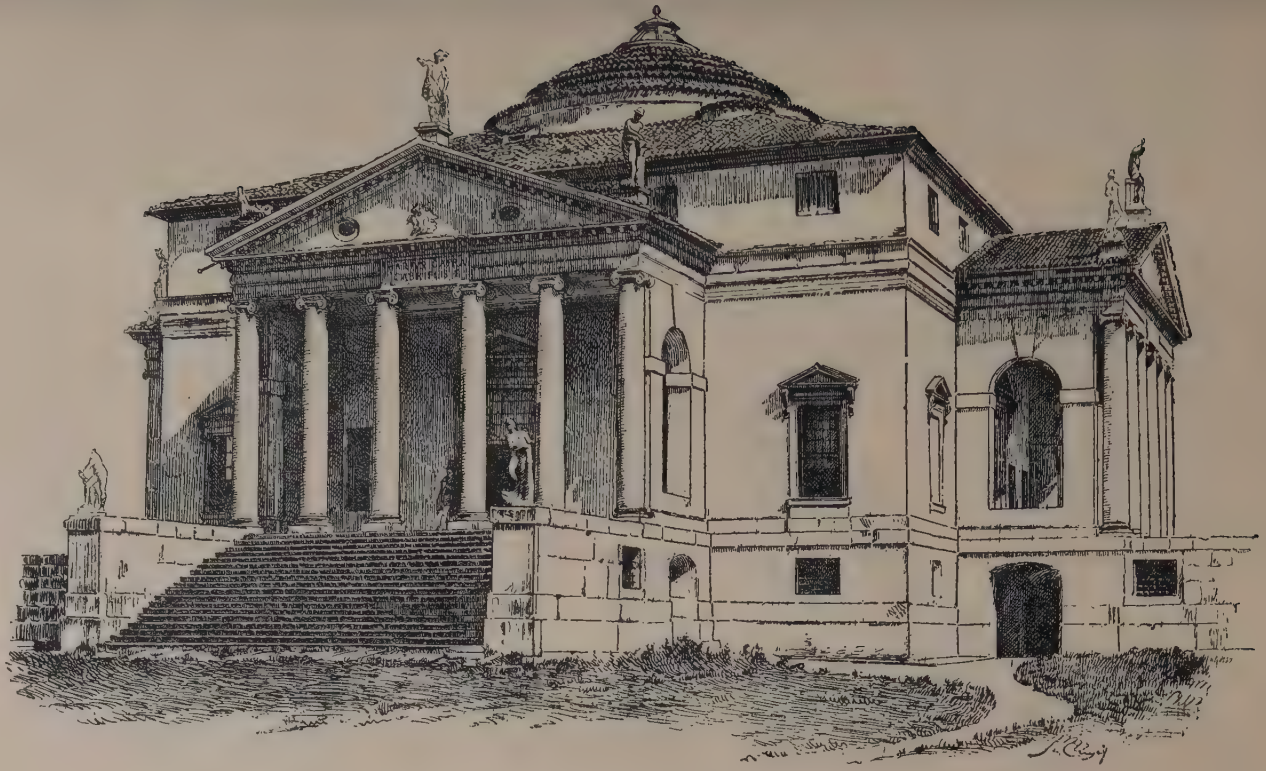


FIG. 230 A. Vicenza, Italy: Villa Rotonda. About 1560 A.D.

rivals in every city, and when Ammanati was building in Florence, and Michelangelo carrying up the drum of S. Peter's cupola. In the North, however, that orderly and systematic code of rules of Palladio's, neatly booked, and offering to every one the simplest grammar and accidence of architecture, is responsible for much contented tameness in later design. It must be remembered that the precept and practice of Italy in 1560 are to be found in the North in 1660 and later, rather than at any earlier time, and that Palladio was not much heeded in England nor Vignola in Germany until our latest epoch, beginning 1665.

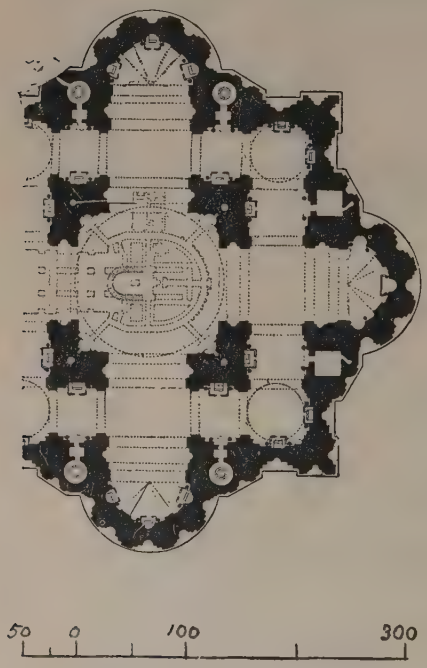


FIG. 231. Rome: Church of S. Peter. Partial plan, as it was left by Michelangelo. 1564 A.D.

The church of S. Peter at Rome, as it was conceived in the middle of the sixteenth century, was a Greek cross, with the four angles filled with domical chapels.[1] All four of the arms of

[1] The church of S. Peter on the Vatican has always, since its foundation under Constantine the Great and in all its forms, had its chancel turned a little to the north of west, and its entrance fronts therefore the eastern and not the western end.

the cross were to be terminated by apses, but the eastern one, which was to be pierced by the chief doors of entrance, was to be reinforced on either side by aisles forming side entrances, and to be extended further

FIG. 232. Rome: Church of S. Peter. Part of north front corresponding with Fig. 231. 1535. Dome, 1590 A.D.

east by a considerable portico. Figure 231 gives the plan of the western half of this remarkable conception, and Fig. 232 a view of it from the north. This view shows the design very nearly as it must have been in the mind of Michelangelo Buonarroti about 1550, that is to say, a year or more after he had taken charge of the work. During his lifetime the building was carried up to the top of the drum beneath the rounding shell of the cupola, and the cupola was built long afterwards from drawings and an elaborate model which had been prepared during Buonarroti's administration. The cupola itself is double, entirely of masonry, the outer shell a little more raised, the inner one a little flatter. The stone lantern rests partly on the inner, partly on the outer shell. The cupola has almost exactly the same diameter as that of the cathedral of Florence, somewhat less than 140 feet, but it rests upon pendentives and not upon a continuous wall, and is so far a greater undertaking. These pendentives are not, however, very bold, except from their great dimensions; the piers which support them are extremely massive, and there is nothing daring in the construction except its unprecedented scale and the great height to which the dome is carried, with the consequent pressure upon the structure. The cupola in itself is beautiful, both within and without. When seen from the east, as visitors to Rome generally see it, it is lost behind the nave built by Carlo Maderno. When seen from the north, west, or south, it loses something of its effect in not having its form repeated in the cupolas which should have been built over the western corner chapels; those of the eastern corners are in place.

The vault of the choir within and of its apse, and also the cupolas of the four corner chapels, spring from a line nearly corresponding to and a little below the top of the large entablature which rests upon the Corinthian pilasters (see Fig. 232). The attic wall, pierced with square windows and carrying the tiled roof, corresponds, therefore, very closely in height with the vault itself. The roof is close down upon the vault, and bears immediately upon it. The square windows in the attic wall light the interior through lunettes, the larger windows below light the church directly, and the much smaller windows are those of staircases and the like. Beneath the large windows are great niches in the outer wall, which are treated architecturally like the windows. All this part of the church is simple, logical, carefully thought out in design; it has no unusual or unexpected charm except in the great cupola itself; the fascination of the Renaissance is not in it. The colossal order of the lower walls is too gigantic, it is hard not to feel that the pilasters are great towers in themselves, and are out of scale as mere adornments of a building which men are to occupy. The exterior, moreover, is cold and bare. Such decoration by means of sculpture as we have found at the Old Library at Venice might indeed have been impracticable in the case of so vast a building; but the building needs something like it, and the money spent on the three great bays of the nave and the gigantic narthex and principal front, which are worse than useless to the church, would have given it the diversified splendour which only sculpture could give. As it is, however, the church as conceived by Buonarroti and his immediate

forerunner and his immediate successor, — Antonio da San Gallo and Vignola, — is a noble structure, not depending on its enormous size more than is reasonable, and designed in accordance with its enormous size except as has been said above in the matter of the exterior order. The later decoration of the interior is in part out of harmony with the design. On the other hand Buonarroti's proposed portico, imitated from the Pantheon, would have been even more unfortunate.

The cities of Italy are full of great *palazzi* or houses of wealthy nobles which were built during the sixteenth and seventeenth centuries. The Farnese palace is the most famous of those in Rome: it was completed by Michelangelo Buonarroti, and its court is an elaborate piece of designing with Roman orders one upon another. The most striking of all these residences are in Genoa, where the effect of vestibule, staircase, court, passages leading to other courts, and the like, and also the stateliness of villas, on hillsides covered with ornamental gardens and terraced buildings, have been carried to perfection in a certain artificial way. The villa Andrea Doria is of about 1529, and its interior is of peculiar interest. The villa Cambiaso in the suburb of San Francesco d'Albaro is a splendid piece of exterior effect in gardens and garden architecture. The Palazzo Sauli, the Palazzo Carega, the Palazzo Doria-Tursi, now occupied by the Municipality, are all of the years between 1560 and 1570. So many and so large buildings had been built, that after 1570 most of the energy of the great families was given to the building of additional

wings and courts, but the interesting Palazzo Durazzo in the Via Balbi is of 1656, and there are still later buildings of the kind as spacious and splendid, but impure in style.

Nowhere in the south of Italy was there as energetic a movement in building as in Genoa. In the Roman states, as in Venetia, the tendency was toward severe uniformity and an unbending system.

In 1556 the country palace at Caprarola near Viterbo was begun by Jacopo Barozzi, called Vignola. In plan and disposition it is a French chateau of the Renaissance, arranged as it is around five sides of a court and enclosed in a pentagonal fortified wall with bastions. The exterior, however, shows the tendency of the time toward formality and the reduction of all decorative architecture to the use of the orders, of which tendency, indeed, Vignola is one of the two great representatives. His treatises on architecture, dating from the years 1563–1580, have had as much weight on the continent of Europe as Palladio's books have had in England; and, indeed, he is considered the embodiment of the academic style. The three churches named above as built in Venice by Palladio exemplify the strong tendency of the time toward this chilling uniformity. The use of the colossal order is only one part of this tendency.

The neo-classic art, as understood by Palladio and Vignola, was by no means a victor without contest. At Rome the *Palazzo dei Conservatori* on the Capitol, begun in 1560, is picturesque in treatment in spite of severe classical details (see Fig. 233). In Florence the court of the

Pitti Palace is almost a work of the Renaissance in variety and elaboration; it was built by Ammanati between

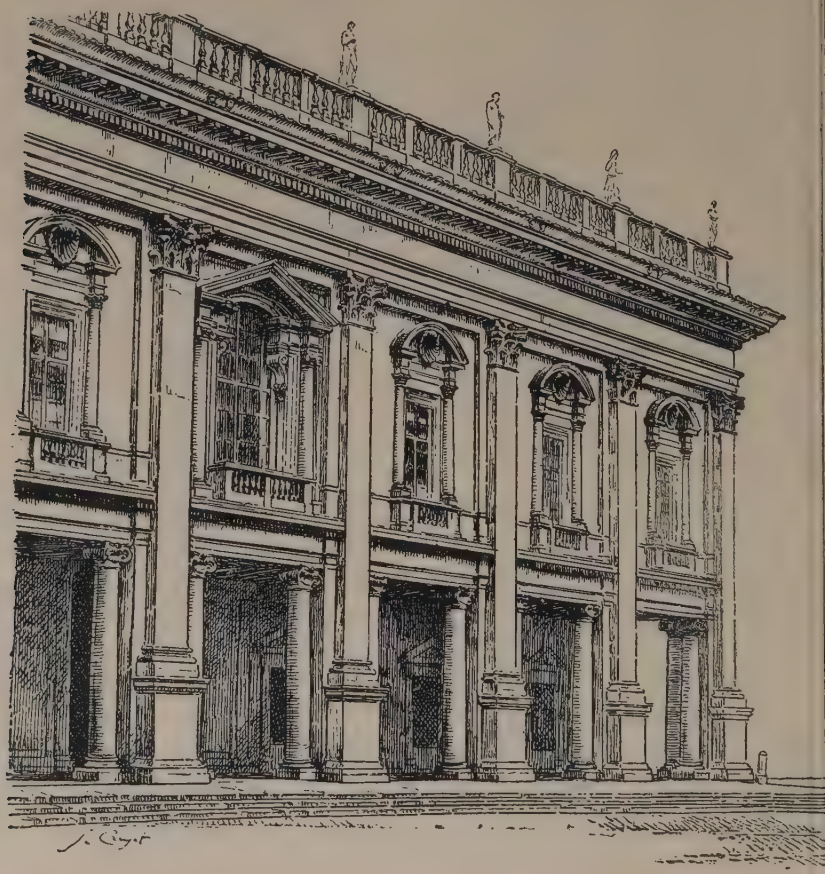


FIG. 233. Rome: Palazzo dei Conservatori. Closing years of the sixteenth century.

1570 and 1575. In Florence the bridge S. Trinita. and in Venice the bridge of the Rialto, have almost a mediæval feeling in their design, and the Bridge of Sighs shows

somewhat of the same feeling, though as late as 1600. At Verona the noble Palazzo del Gran' Guardia, described above (see p. 454), is of 1610. Still, however, everything tended toward formality and the treatment of architecture as if its practice consisted of a series of academic propositions. The great colonnades of S. Pietro at Rome belong to the next epoch rather than to this, but the design of these must have been made as early as 1665, and their architect Bernini would have begun them earlier but for his visit to Paris.

CHAPTER IX

THE ARCHITECTURE OF WESTERN EUROPE ABOUT 1665 TO 1789 A.D. THIRD PERIOD OF NEO-CLASSIC ART. THE NORTHERN NATIONS AND SPAIN GENERALLY FOLLOW THE EXAMPLES FURNISHED BY ITALY DURING THE PREVIOUS PERIOD (1520–1665) AND NATIONAL STYLES TEND TO DISAPPEAR IN UNIFORMITY, BUT MANY LOCAL AND TEMPORARY COUNTER INFLUENCES ARISE. ITALY PRODUCES LITTLE OF IMPORTANCE AND ORIGINATES NOTHING.

PREFATORY NOTE

DURING the years from about 1541, when Pierre Lescot's designs for the Louvre were put in hand, to 1665, when our present record begins, the practice of architecture throughout the north of Europe had been undergoing a great change. This change was in the substitution of drawings to be closely followed, even in minute details, for drawings of general effect used under the direction of the maker of them, but allowing of large liberty in the execution of the work. For the workman this meant substitution of precise accuracy in following drawings for the free practice of a traditional art within certain limits set by drawings. The latter, the mediæval way of proceeding, was not compatible with the attempted introduction of wholly new details nor with the strife among the architects as to who should follow most exactly the example set by

the ancient Roman builders. It is evident to all students of the buildings that Chambord might have been built as the neighbouring cathedral of Bourges had been built, when once the stonecutters had been shown what a pilaster was, and how Roman mouldings differed from Gothic ones. On the other hand, the court of the Louvre, the front of the Tuileries, the contrasting façades of Écouen, with their carefully studied orders, required the exact laying out on paper by the architect of details as well as of general masses.

It is probable that no change so abrupt as this took place in Italy. In that region the artist-director had been for centuries a much more marked individuality than in the North. Individual artistic ability had long been more remarkable and more in repute. The painter of panel-pictures and of miniatures in manuscripts, the chaser of sword-hilts, and the designer of stained glass was much more of a celebrity in the south than in the north of Europe. Men of the simplest lives working in their shops or in the mansions of great nobles for slender pay were still known throughout the Peninsula as men set aside from the crowd by the possession of trained artistic faculty. The very frequency of the familiar nickname or abbreviated Christian name for the patronymic shows how common this kind of celebrity must have been. Moreover, in Italy the Gothic architecture and decoration, though prevailing for two centuries, was never the natural growth of the Italian spirit, as the Italian painting and sculpture was. Always when a Gothic building was taken in hand in Italy, the superintending architect came more to the front; more was put

upon him, more was expected of him, than in the North. The line, too, between the mason and the sculptor was much more sharply drawn in Italy. The simple building, the rough, unbroken brick walls, the unorganized structure, could be brought into existence by workmen of but little skill, while the sculptor was carving the setting of the single doorway. But in the North the workmen on a Gothic church worked together in a traditional way very hard for us now to understand; and the traditions, the familiarity with certain forms, the habit of combining details in certain ways, the knowledge of how decorative effect was to be got under certain conditions,—all this was matter of common knowledge among a large body of workmen, and descended from father to son and from master to apprentice. The difference is mainly that this traditional way of work was confined in Italy to a smaller and more select class, while in the North it was more common, more widely diffused, and brought no such individual repute to its possessors. In Italy modern times for art began in the twelfth century, in the North not till the sixteenth.

I

Giovanni Lorenzo Bernini, born in 1599, had risen to great celebrity in Italy. At the age of thirty he had been put in charge of the never-ending work on S. Peter's Church at Rome; and he had built additions to the Vatican Palace, besides planning that great Place of S. Peter. In 1665 he came to Paris, invited by Louis XIV., at the suggestion of Colbert, who became Director of Fine Arts

the following year, centralizing art as everything else in the State was to be centralized during this reign. Levau was employed already upon the Tuileries, where he was destroying the work of Philibert de l'Orme, that triumph of the Renaissance; and Claude Perrault, who was not an architect by profession, had made a design for the east front of the Louvre; Charles Le Brun was the king's adviser in everything that had to do with fine art. Bernini had sent in advance a design for the eastern front of the Louvre facing the church of S. Germain l'Auxerrois, and, on his arrival, began to propose radical changes in the Louvre involving gigantic buildings and completely overthrowing the traditional form of the old chateau begun one hundred and forty years before. His designs admitted of no possible modification, for it appears that the old man, full of his Italian fame, expected the princes of the barbarians to accept his proposals without question. The king tried to persuade him to remain in France, in spite of the rejection of his designs for the Louvre, but he returned to Italy after a few months, and nothing of his was left in France but the bust of King Louis.

The east front of the Louvre was then undertaken according to Perrault's design, and as it now exists. A basement, which is pierced by windows of a most feeble design, and which is neither massive in the style of the Roman and Veronese palazzi (see p. 452), nor yet open and light as in the library of S. Mark (see p. 456), carries a portico of coupled Corinthian columns. At each end of the façade a pavilion is placed with very slight

projection and no greater height, but with solid walls and pilasters instead of the open colonnade; and these pavilions are given a surprising importance and dignity by being divided each into two masses with a large open niche or bay between with a pair of columns *in antis;* so that the open portico seems repeated in these, and the length of the front is greatly extended in effect. A central pavilion of very different character is made up by carrying the arch of a great doorway far above the top of the basement, and by advancing four couples of the great columns to carry a Roman pediment above this principal entrance. It may be said that the whole upper story, containing two actual stories of the building, is fine and dignified in design. The larger and the smaller windows in the pavilions are well placed and good in themselves. The pediment is well proportioned and in harmony with the substructure, which makes of that projecting part of the colonnade a vast porch of entrance; the colonnade is excellent in itself and in its relation to the end pavilions and the central porch. It is a curious instance of the growing estrangement between architectural design and the industrial art of planning and building that the halls behind the colonnade have no windows opening upon it, as it was found impossible to make them correspond with those of the courtyard front. Moreover, the colonnade with its pavilions was deliberately made a good deal longer than the building behind it, so that the pavilions projected in awkward blocks of building beyond the north and south façades; but on the south, new work, directed by Perrault, greatly in-

creased the depth of the building in that part and caused that fault to disappear, so that it may be supposed that a similar treatment was intended for the northern front, though of this there is no record. In 1670 that new work by Perrault was begun. The open portico was not repeated, but an order of pilasters as high as the columns of that portico was carried along the whole south front, and is a good companion to the eastern façade. It is not surprising that the building served as an example for the architects of the century that was to follow. The "colossal order" of columns and pilasters, so high as to take in several stories of the building, though without example in antiquity, was thought eminently fit to serve the turn of would-be designers of stately buildings. The next step to take was to set the columns and pilasters of this colossal order upon the lowest stylobate of the building immediately above the ground, and thus to make the order as high as the building; and this step was soon to be taken.

In the meantime, the chateau of Versailles was growing far beyond the limits first set to it, as of a hunting seat or a country chateau, one of many belonging to the Crown; and in 1670 Jules Hardouin Mansart succeeded Levau, and the vast garden-front was begun in earnest. It is frequently said that the determination of the king not to exceed in height the old hunting lodge of his father, and the consequent limitation of the height of the building to a basement, a principal story, and an attic, causes certain inferiority in the front, its vast length — nearly a

quarter of a mile — contrasting strangely with a height of not more than sixty feet. This, however, is a peculiarity to be stated, and not necessarily blamed. There is a certain magnificence in the uniform and not excessive height reigning throughout in so great a building, and it is by no means certain that the raising of pavilions to the height of another story would improve it. It must not be forgotten that this garden-front is by no means in one plane. The central block projects on the terrace beyond the long wings of the palace by actually one-fifth of the whole immense length, and the wings again have smaller but still very considerable breaks on either side, so that the ordinary view of the garden-front on this side is very far from being monotonous, and it is only by looking at the building along its principal axis, and from a very great distance, that the façade can in any way seem flat. It is on record that Louis XIV. proposed to crown his great structure with a series of high roofs, but that the burdensome wars of the years following 1688 prevented this plan from being carried out. The fault really to be found with the garden-front is, strangely enough, its lack of massive dignity. It has too many windows, too large and too near together: the arches of the openings are not loaded by enough superincumbent wall; the porticoes with free columns, of which there are several in the principal story, have not projection nor shadow enough. The whole front seems to one who walks along the terrace too thin in its walls, too slight in its piers, too feeble in its arches, while from a distance the glitter of its innumerable windows turns it into a lantern, and one

remembers with dreadful comparisons the statelier buildings of Italy.

One important and semi-detached part of the chateau deserves, however, much more praise than has been given it, — the chapel, the design of which dates from the very latest years of the century. This is a noble building, and would alone immortalize Mansart. It is one of the finest things which Europe owes to the completed classical revival, and is assuredly the most important church of moderate size which was built between 1650 and the great French Revolution. Other churches will be named which are superior in many ways, but this one is of consistent design inside and out. It is constructional, and its rich and florid ornament is well kept in hand and well combined for the best effect, both within and without. It is then superior to S. Roch of Paris in consistency of design and to S. Geneviève of Paris in decorative effect, to the English churches of the epoch in richness and in the absence of wooden imitations of vaulting and the like, and to the German churches and the Italian churches generally in good taste. The Versailles chapel has a nave and aisles and a rounded *chevet* at the eastern end, clear-story windows and aisle windows complete, buttresses, too, and gargoyles to throw off the roof water. It has, moreover, that relative height which the same system of building led to in the Middle Ages. The whole of this mediæval framework is dressed in the most completely worked out late-Roman neo-classic, without any renaissance feeling; and yet it is not at all incongruous. Interior and exterior, requirements of plan and

resulting design, all comport most thoroughly with one another. It was quite understood that the king would seldom visit the lowest floor, and so the aisles took the unusual form of an upper gallery of greater height, and a much less lofty basement. The nave pillars, therefore, are square below, carrying round arches, and free Corinthian columns above, with square pilasters at the angles, carrying an entablature. From this entablature springs the vaulting of the roof, the lunettes of which are filled by the clear-story windows. Figure 234 gives the general effect of this fine interior. Outside the lower story is marked by a basement with segmental-headed windows, borrowed from the basement of the Louvre colonnade; but these are divided by flat pilasters, and the very massive buttresses break up this basement, and give solidity enough. The principal gallery, which forms the upper story of the aisles, and which received the king and his courtiers, is marked by very high arched windows, divided by the pilasters of a fine Corinthian order. Gargoyles for the roof-water, one over each window, break the architrave. Very heavy buttresses at the rounded eastern end are decorated with corner pilasters of the same order. Above this story a parapet with large pedestals, each of which carries one or two statues of heroic size, is employed to screen the flat roof of the aisle, and the clear-story is treated like an attic with a steep roof. There is a good deal of well-placed sculpture about the building, and the statues are of considerable merit, in the taste of the Regency.

This chapel, and the Louvre colonnade, are the best possible types of the rich architecture of the time, the

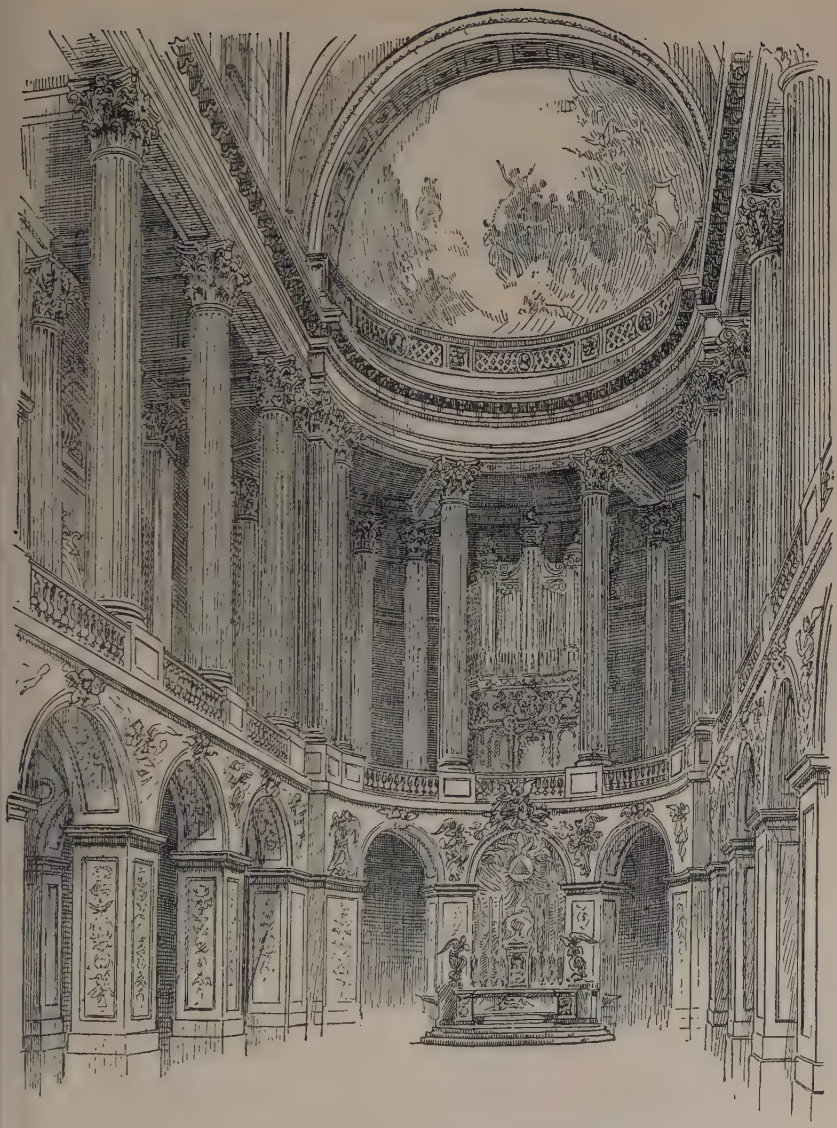


FIG. 234. Versailles, France: Royal chateau. Interior of chapel. 1710 A.D.

NOTTINGHAM

architecture in which no cost is spared.[1] The simple design of the time is well seen in the great front of the Hôtel des Invalides in Paris, built about 1670 by Libéral Bruand. The fault inherent in the developed late Italian, Palladian, Roman, or neo-classic style is seen in this fact, — that except the classical orders with pediments, parapets, attics, and pedestals, no architectural ornamentation is in use. Where a building or a façade can be treated at considerable expense, there is no difficulty in making it attractive by means of colonnades, rows of pilasters, and the like, and the experience of three hundred years shows that no other architectural adornment is as generally popular among European peoples as are these classic or pseudo-classic details. But when for any reason these orders and their accessories cannot be used, and when the nature of the building forbids that insistence upon its structural system which we have found in the Versailles chapel, there is nothing left but the spacing of windows and doors, and the arrangement of the larger masses of the building. There are none of the charming devices of the Renaissance, the panelled and sculptured pilasters, the window-framings and the door-pieces of unexpected and startling design, the dormer-windows which break the cornice and carry the wall up into the roof and into the sky, the bold string-courses and double string-courses, the columns with sculptured shafts, and the candelabra doing duty for columns. All this fantastic and graceful decoration is abandoned, and

[1] But see, below, what is said of the *Ministère de la Marine*, built fifty years later.

the wall-surface is blank and bare, and pierced with equal openings at equal distances and not otherwise enriched, except where a portico or an order of pilasters is introduced. There remains indeed *proportion*, and this is the great virtue of the late neo-classic styles; but indeed proportion grows in charm as it grows more subtile and unexpected, and the proportion obtainable in the large flat walls of a three-story structure is not especially fine nor inspiriting. The École Militaire, near the Hôtel des Invalides, may be compared with that structure in this respect. It is thirty years later: it has three porticoes projecting from its central mass and its two wings, but except for these the vast structure, as long as the garden-front of Versailles, has very little architectural pretension. To compare with these two buildings the more ornate designs of the time is to come back to the other part of the same alternative: thus the four fronts of the Place Vendôme in Paris, built in 1699, and the curved façades on the Place des Victoires, a little earlier, offer the familiar row of pilasters set upon a basement, the pilasters enclosing two or three stories of the houses behind them.

The rich buildings of seventy years later are adorned as the eastern front of the Louvre is adorned. There can hardly be in Europe a finer example of the late neo-classic than the *Ministère de la Marine* and its neighbour and peer, the row of private houses on the other side of the rue Royale, both fronts looking southward on the large — too large — Place de la Concorde. Each front (see Fig. 235) is over three hundred feet in length, and each consists of two wings projecting and faced with temple-like

tetrastyle porticoes and pediments, and a deep portico between, with twelve Corinthian columns: an arcaded basement rusticated and very sagaciously broken to match the projections and retreats of the principal story, has the gift of looking massive enough in spite of its many openings. This design is superior to that of the Louvre colonnade, and is certainly unsurpassed by that of any frontispiece or

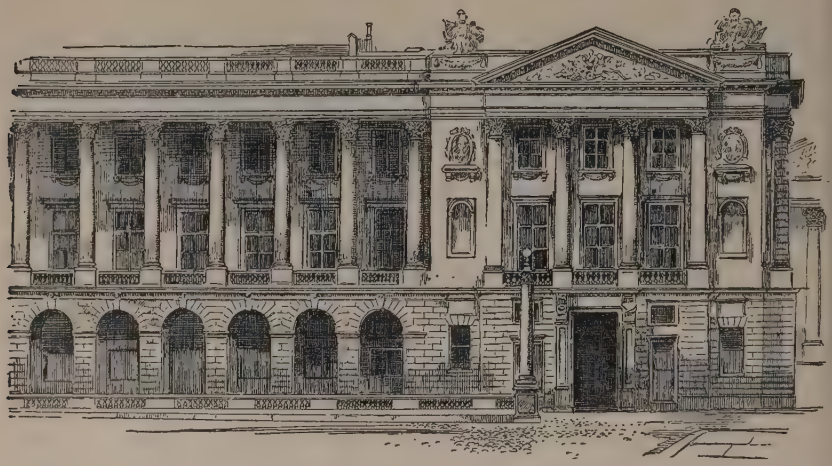


FIG. 235. Paris: Ministère de la Marine. One half of south front. 1760 to 1765 A.D.

façade in Europe; but it helps establish the general truth that the style of the eighteenth century had few resources outside of Roman colonnading. Suppose these buildings to be free at the back, looking out upon a narrow and unimportant street; the northern façades so obtained would be flat or slightly broken walls with evenly set windows in them, and it would be difficult to imagine a system of design which would give them interest. The slight decoration of the windows and the medallions and

festoons, moderately introduced in the two beautiful southern fronts, are only the more delicate touches given to what is already a very rich and splendid design. Ornaments like these would be of no value on very simple façades such as those supposed above; and indeed it has always been felt that the fronts which are not masked by an order of columns or pilasters are better without such minor decorative features as the style could still furnish.

The eighteenth century is more rich in fine churches than the preceding years. The designs which are on a wholly non-mediæval system are of course the most interesting. Even the serious and successful attempt made at Versailles to clothe a mediæval plan in late classic decorative style is less worthy of study than the bold experiments seen in the domical church of the Invalides and the church of S. Geneviève. The former should be considered almost wholly a magnificent monument erected in honour of a state religion. It was built in 1706, in addition to and adjoining an older church dedicated to S. Louis, which still stands in the courtyard of the enormous structure built by Louis XIV. as an asylum for disabled soldiers, and is still in use in part for that purpose. The new building erected by Jules Hardouin Mansart is nearly two hundred feet square and rises to the height of three hundred and forty-five feet; but in spite of its considerable dimensions it has but a small available interior, and affords only a Greek cross with arms less than forty feet wide, and four round chapels covered with cupolas in the four angles of the cross. The solid masses are excessively great, and a study of the plan makes it evident that a far more massive

superstructure was in the mind of the architect than that which the distresses of the later years of the reign would allow. This building is famous for its constructive excellence, and, indeed, it is a piece of well-considered, well-calculated masonry up to the top of the drum, and also to the top of the second stone cupola which is seen through the great ring in the first or innermost cupola. Above that, the outermost dome, which is seen from every part of Paris and the neighbouring country (see Fig. 236), is a mere shell of woodwork covered with lead, with a lantern of the same inferior material. The very objectional form of what may be called the aisle-roofs, that is the roofs of the lower structure surrounding the great dome, is common to many churches of the epoch. It is a mere device for concealing the roof altogether and in a sense denying its existence, as no means of carrying off the roof-water are visible. The vaults are covered by a roof sloping downward from the outer wall and from the wall which carries the dome, toward a gutter in the middle. At Versailles no such wretched deference to a conventional rule exists, but gargoyles as bold as those of a Gothic cathedral carry off the water; and at S. Geneviève the outer roof everywhere is a visible and a working roof, though it is not of much effect in the exterior architecture.

This last-named church, called also the "Panthéon de Paris" since its dedication to the heroes of France during the great revolution, and the putting up of the celebrated inscription above its porch, *Aux Grands Hommes la Patrie Reconnaissante*, is in form a Greek cross; though the choir and a staircase beyond it at the east end and

FIG. 236. Paris: Hôtel des Invalides. The later church. About 1706 A.D.

the great porch of entrance at the west end make its outside dimensions about three hundred and eighty feet east and west by two hundred and seventy-five north and south. The cruciform-shaped interior has aisles which follow nave, choir, and transept alike, and has, combined with these, a very unusual and striking arrangement by which each one of the four arms is made a domical church by itself with a cruciform treatment of its own vaulting. At the crossing of the nave and transept four piers carry the pendentives of the dome, and it is on record that these piers were made too light by the architect Jacques Germain Soufflot, and were afterward rebuilt with larger section by Jean Baptiste Rondelet under the reign of Napoleon I. The cupola is not in itself of very great size, but it is of masonry to the top, with this peculiarity, that the lantern, also of masonry, rests upon the intermediate cupola much as that of S. Paul's of London rests upon a brick cone. The greatest peculiarity of the exterior design is the peristyle of Corinthian columns, arranged in circle around the drum and carrying an open gallery, so that the cupola itself seems small in comparison with the much broader substructure. The windowless walls of the church proper are treated very skilfully and successfully with a modified Roman pilaster system, which gives great dignity and a singularly monumental character to the building. The most marked character of the interior is the admission of daylight through the roof alone, and the resulting unbroken wall surface which the painters of the nineteenth century are utilizing.

The Madeleine of Paris is also of this epoch, though

not finished until eighty years after the adoption of its design. Large and splendid as it is, it cannot greatly interest the student of architecture except as a study of light and shade on great masses of columnar and trabeated construction. It is the semblance of a Roman Corinthian temple, peripteral and octostyle and of enormous size, but is entirely built of small materials, its columns built up like towers and its architraves composed of flat arches. Such building is not strictly architecture, but is scenic or theatrical work, whatever its cost or permanence. The fault of the architecture of this epoch, taken together, is, of course, its tendency toward the scenic and theatrical, — the lack of a sufficient basis of utilitarian and constructional necessity; but the Madeleine passes the bounds of what is to be received as architecture at all. Far more important to our enquiry is the Paris church of S. Roch fronting on the rue S. Honoré. This church, the interior of which is given in Fig. 215, was begun in 1653, by Jacques Lemercier, and all that is valuable in the church is due to this artist, for the front is unimportant. The interior is arranged upon a cruciform plan, with clear-story windows in the lunettes of the vault. Its design is extremely massive; Roman Doric, with square piers faced by flat pilasters, which act as vaulting-shafts. Once the presence of heavy piers in the interior admitted, and the consequent separation of aisles from nave, and the interior of S. Roch becomes a model for all artists who wish for grave and dignified interior design. Strangely in contrast is the interior of S. Sulpice, on the south side of the

Seine: the church which even unobserving travellers know from its remarkable front of open porticoes in two stories. Although the plan is by Levau and dates from the earlier days of Louis XIV., and although the lower part of the interior is as severe and in as noble a style as S. Roch, the vaulted roof, with its exaggerated, perhaps elliptical section, and its wretched applied ornaments, is a complete example of the influence of the worst Italian taste, — that of the school of Borromini represented by Oppenordt. This vulgar decoration, which in Italy is only worthy of contempt, and is as bad in France when applied to the more massive works of architecture, is yet allied to the very fascinating interior decoration which is called that of the Rococo or Pompadour style.

After the death of Louis XIV., in 1715, the general relaxation from the narrow-minded severity of his later days showed itself at once in the architecture of the time. The private houses which were built during the reign of Louis XV., the first eight years of which were the famous Regency, are models of careful and skilful arrangement, and are considered by the French as the beginning of their own modern system of house-planning, which, of course, is widely different from the English system. The smaller size and more domestic character of the rooms brought with them the decoration in moulded and embossed plaster for the ceilings, and in wooden panelling carved in delicate scroll-work painted white and gilded, with pictures of some value set over the doors or painted on panels; which decoration has never since ceased to be in special favour in France. This simple style was

easy to elaborate into something much richer, when means were sufficient and the occasion called for it. Thus, in the Hôtel de Rohan-Soubise, which is now used for the National Archives of France, the rooms in which is kept the Museum of Manuscripts and Autographs were decorated about 1736 in a superb style, which combines the new eighteenth-century minuteness with some of the power shown by Charles Lebrun and his able contemporaries during the previous reign. It is as if the large *Style Louis Quatorze*, as it is seen through all modern retouching in the Gilded Gallery of the Bank of France and the Gallery of Apollo in the Louvre, had been consulted by the artists in charge of the Hôtel Soubise, who learned there what modifications their dainty contemporary art would need when applied to large apartments. Figure 237 shows a part of the oval drawing-room of the Hôtel Soubise. This rococo style, which it is easy to find fault with for its unconstructional system and its absence of firm basic lines, exhibits these faults far more plainly in the movable objects of the time — furniture, mirror frames, *coffrets*, *étuis* — than in even the smallest and least architectural pieces of building-decoration; but what is extremely curious is that it is very difficult to find in France a building whose exterior in any way corresponds to the common idea of the *Style Pompadour*. It is curious to note that the external structure of that very oval drawing-room is the severe little pavilion shown in Fig. 238. In fact, the reaction under Servandony had begun before the more florid style had taken strong hold. That able man had been appointed director of the decora-

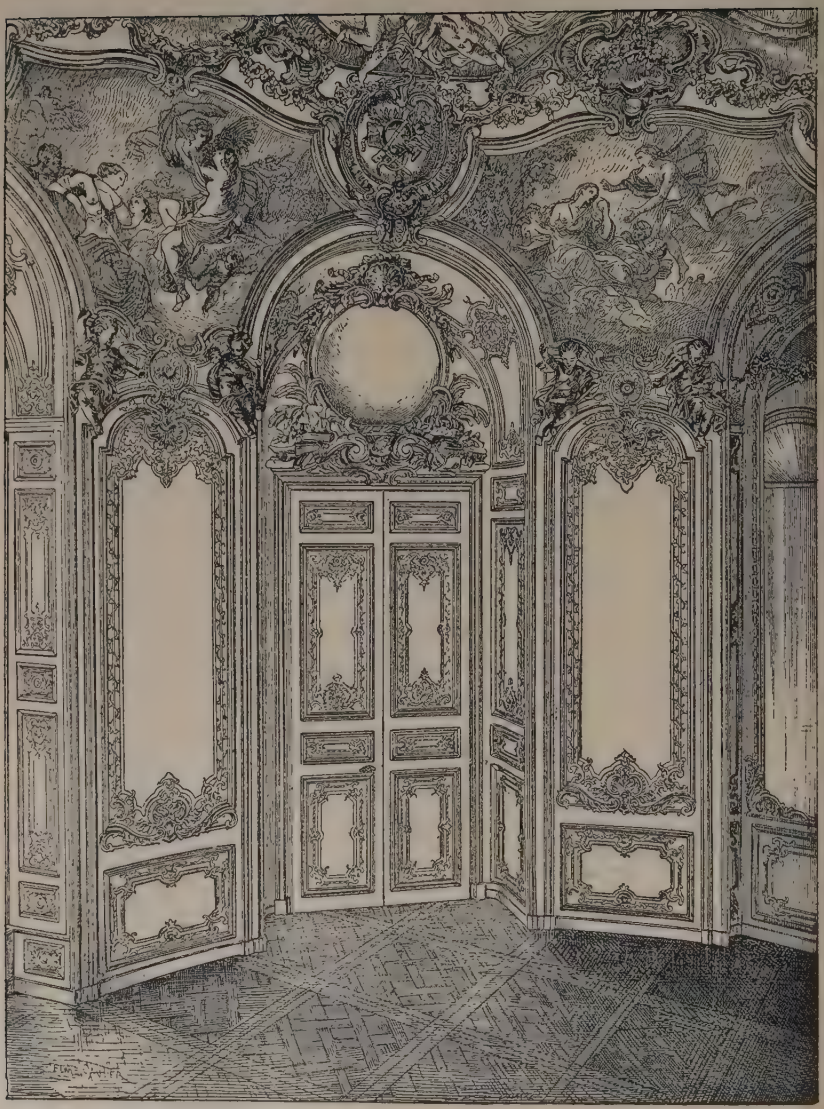


FIG. 237. Paris: Former Hôtel Soubise, now National Archives. Interior of a saloon. About 1730.

tions in the Paris Opera House as early as 1728; and four years later he began the front of S. Sulpice, in Paris, which front was a strong and successful attempt to

Fig. 238. Paris: Former Hôtel Soubise, now National Archives. Exterior of a pavilion (see Fig. 237).

bring back architectural design to classical purity of feeling. The rococo decorative style may be said to have endured fifty years, from 1720 to 1770, but the buildings

which the guide-books speak of as rococo in style are generally much earlier in date, such as the front of the church of S. Paul and S. Louis on the rue S. Antoine mentioned above.

The front of S. Sulpice was completed, except the towers, between 1732 and 1746. It consists of two stories, of which the lower one is a Doric portico between two projecting enclosed wings, and of which the second is Ionic with arches resting on imposts between the columns. The whole is on a very large scale, the width of the front being about 180 feet, and the towers higher than those of Notre Dame. The design was a new departure in architecture, and is extremely effective, although there is a certain lack of fitness in the large upper galleries, which seem intended to hold a crowd.

Other buildings of late date are, besides the Ministère de la Marine and the Panthéon already mentioned, the Halle au Blé, near the Louvre, the Mint on the Quai Conti, near the Pont Neuf, the church of S. Philippe du Roule, l'École de Droit, near the Panthéon, l'École de Médecine, except its nineteenth-century front, the Odéon and the Palace of Prince de Salm, which forms the nucleus of the present palace of the Legion of Honour. The severity of design familiar to those who know Marie Antoinette furniture, in which the delicate ornamentation is contained within decided and generally straight bounding lines, is present in all these buildings in greater or less degree. It is one of the artistic glories of France that the later neoclassic architecture, with its constant tendency toward excess, never reached any serious degradation such as is

commonly found in seventeenth and eighteenth century buildings elsewhere in Europe.

II

In the lands which now form the two little kingdoms of Belgium and the Netherlands, the epoch from 1665 to the French Revolution was not one fortunate for architecture. It would be unfair to take the doorway shown in Fig. 239 as representative of the ornamental building of the time; and yet it shows in an unexaggerated manner some of the tendencies against which art had to strive; not always successfully. There is the same false picturesqueness in detail which we have found too common in Elizabethan architecture, and which consists in sharp edges and abrupt curvature; and there is an

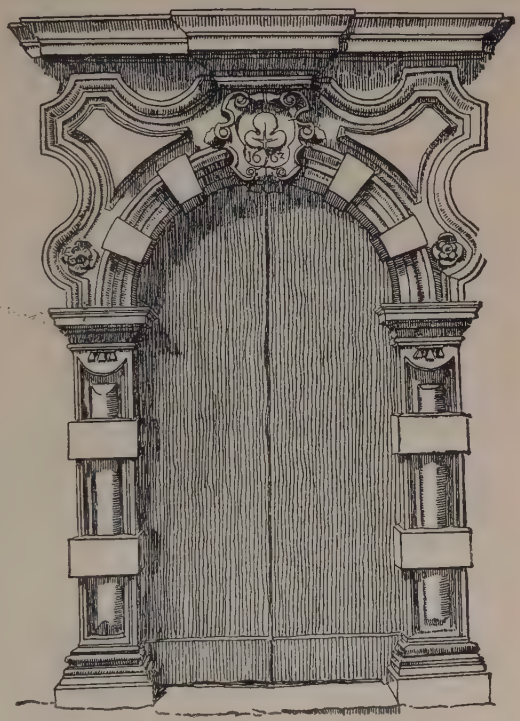


FIG. 239. Antwerp, Belgium: Doorway of a court. 1663 A.D.

excess in the purely architectural forms which the Elizabethan style was free from. The beauty of the masses in the Elizabethan country houses seems not to have found its way to the Netherland provinces. The wonderful charm of sixteenth-century work is gone, and nothing is left to replace it except a grave simplicity in many buildings both public and private; buildings in which indeed there is little architectural art except that which lies in tranquillity and not unpleasing outlines.

The dwelling-houses in the Belgian towns retain, down to the end of the reign of Louis XIV. of France, a singular independence of the general current of European architecture, and dated buildings of this class exist which are built with a considerable sense of architectural effect, and yet are neither belated Gothic nor revived classic. In this they resemble those Elizabethan and Jacobean buildings in England which are the most nearly free from the peculiar strap ornament and scroll ornament of the time. Such houses exist in Ghent on the quays and in Brussels on the great squares; many of them are disfigured with misapplied carving, but the simplest are of great interest.

The church of S. Michael at Louvain is an excellent example of a style rarely found in France. It marks the later development of that curious, overcharged, and unorganized system of decoration which is called the style of the Jesuit churches. The great abundance of broken curves, short and abruptly terminated lines, and meaningless added details other than sculpture, could all be endured if any general feeling for appropriateness of

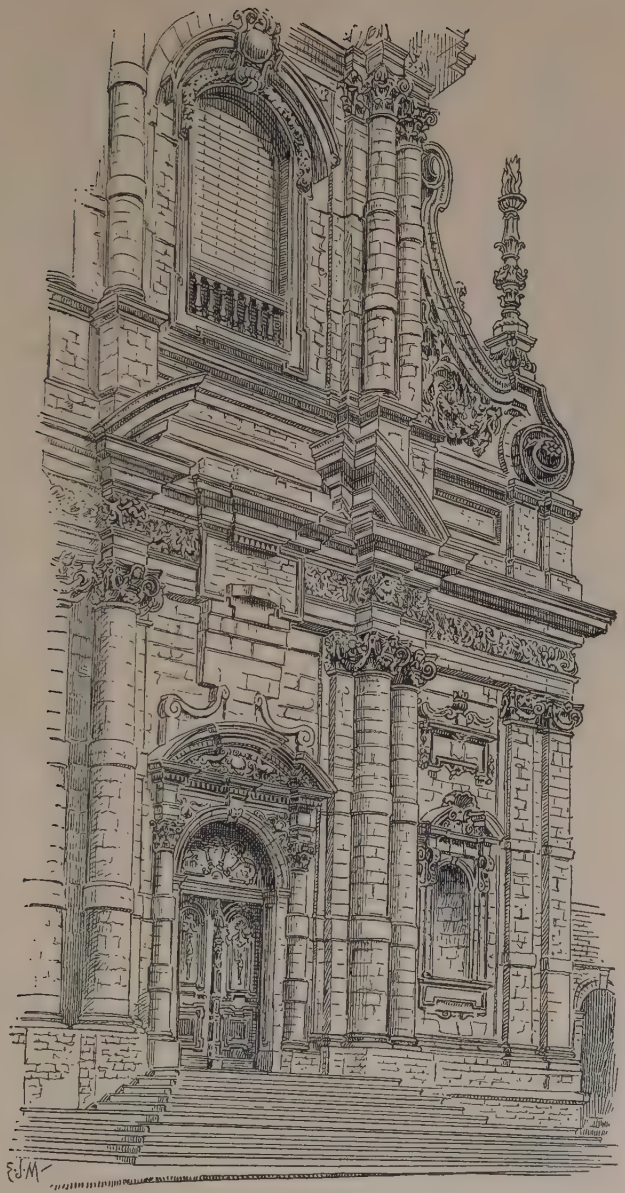
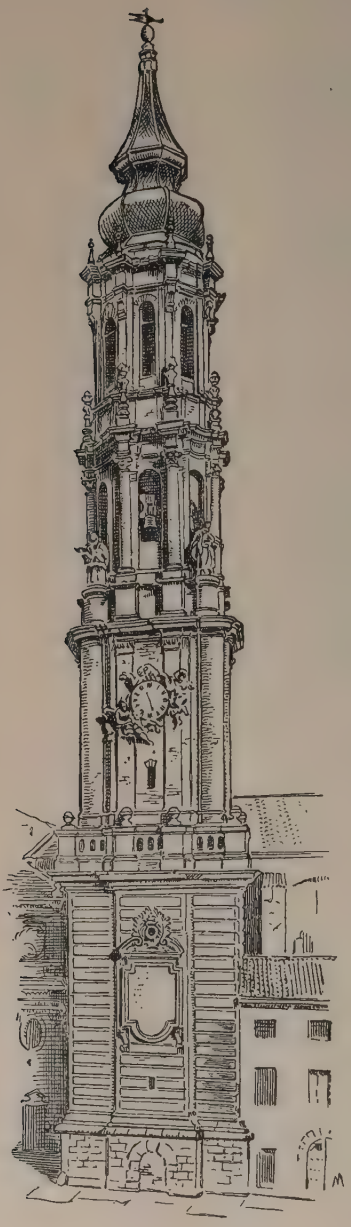


FIG. 240. Louvain, Belgium: Church of S. Michael. Part of front. 1650 to 1660 A.D.



design, or any strong sense of proportion, had controlled this front (see Fig. 240).

In Spain, the style which is named after Josef de Churriguera was flourishing in 1665. It is a belated form of the corrupt and degraded Italian of the Borromini school, but there is in it a charm which the Italian work does not possess, coming evidently from the natural ability of such designers as Pedro de Ribera and Geronimo Barbas, and especially Churriguera himself. The newer cathedral, "El Pilar," at Zaragoza, is nearly all of 1677, and in the same town is the church of S. Cajetan, with a remarkable façade consisting of a gable between two towers. The façade of the old cathedral is flanked by a spirited tower dated 1685, while the new cathedral itself has one of its towers nearly completed, which also is worthy of notice. Figure 241 shows

FIG. 241. Zaragoza, Spain: Old cathedral. Tower. Probably about 1685 A.D.

the tower of the old cathedral, called "El Seo"; that is, the church of the see or the diocese. It is entirely of brick-work except the great balustrade at the top of the basement, and the pinnacles and pedestal, which are perhaps later in date. It is of course as heretical when tried by the classical laws as any Jesuit church of Italy or of Germany, but there is boldness of design about it which is not common. The front of the cathedral of Santiago de Compostela, which was built between 1680 and 1700, is still more to the purpose, as showing how the Spaniards whom we have named and their fellows could treat ornament when applied in excessive and overwhelming quantity. This front is covered all over with scrolls, engaged columns with carved shafts, and others whose shafts have a few large flutes, dwarf buttresses ending in volutes, pinnacles of square section and elaborate outline, and statues of spirited pose and gesture. All this is applied not upon a flat façade; the west front consists of two square towers with an extremely ornate and lofty gable between them, and has the unusual addition of two enclosed porches, one to the north and one to the south, and between these an enormous double perron; moreover, the breaking up of the front with columns carrying *ressauts* is unusually bold. All this, which it would be easy to make ridiculous, is saved by the extraordinary skill with which it is handled. Something of the same skilful use of inferior ornamental materials is visible in the celebrated front portal of the palace of S. Elmo at Seville, the date of which is about 1720. The front of the Ayuntamiento or town-house at Salamanca of the same epoch shows the

poor details carried farther in the road toward complete bårbarism; the firm lines of the architecture almost concealed by the ungainly broken curves and unorganized and unarranged rosettes and bouquets. This building is, however, saved from entire badness partly by the grave arcade which serves as an open gateway between streets, and which seems like a work of the Renaissance, and partly by a sense of general proportion which has kept the larger masses of the building in order. One feature common to these able artists of a degenerate time is the decorative structure built above the cornice and assuming shapes sometimes more like a gable, as at Santiago and at S. Cajetan of Zaragoza, sometimes of a bell-gable as at Salamanca town-house, sometimes of what seems a Roman triumphal arch as in the S. Elmo palace at Seville. Sometimes it is pierced so that the statues are seen against the sky beyond, sometimes it is massive, and pretends to mask a roof; but in any case it is an ornamental adjunct to a front, whether of a church or of a civic or domestic building, which is well worthy of study.

The restraining influence of good taste and native power of design which is plainly seen in the buildings named above disappears in some structures of the same time; that is, from 1720 to 1750. At Granada the Sacristy of the Cartuja, or Carthusian Convent Church, is given over entirely to mere gimcrack ornament, the underlying principle of which is to leave no straight line or curve of the constructional parts unbroken; to pile one irregular and formless detail upon another, and to magnify the meanest details of inferior metal-work. This evil tendency found

opposition, and successful opposition, in another body of architects, who brought renewed study of actual Roman antiquity and a purer taste to their work. The grave and manly design of the Royal Palace at Madrid is like the

FIG. 242. Madrid, Spain: Palace court. About 1730 A.D.

introduction of the feeling of 1550 into the Spain of 1730. The exterior is a very dignified composition, having nothing but its colossal order to indicate its late date, and no serious fault as a design except the too equal division of

its walls horizontally, — resulting from the unusual height of the basement. The great court with its arcades in two stories, all on a very large scale and of a severe Roman style, except for the Ionic capitals with their festoons, looks like nothing so much as a Roman cortile of two hundred years before (see Fig. 242). The charming palace at La Granja is, as the guide-books say, a piece of pure French *Louis Quinze* design imported bodily into Spain. It is more nearly rococo in style than anything in France that we have had occasion to specify, and its accessories in the garden and elsewhere are still more *baroque* in character. The interesting triumphal gateway called the Alcala Gate, at Madrid, built in 1778, as an inscription states, is a design of mixed character. The main lines are extremely firm and the main masses fortunately combined. There is nothing to consider extravagant or excessive but the sculptured details, which are indeed unmistakably Pompadour.

III

In Germany the epoch opens amid a confusion of exaggerated forms and a constant search for novelty, which have an odd effect when displayed within the limits of the latest neo-classic style. The same love of the picturesque, which we have found always characteristic of German work, has now, at the close of the seventeenth century, given up gables and steep roofs and turrets, and shows itself in constant efforts to modify the classical orders and to use those orders themselves for very non-classic effects.

Thus the great building formerly the palace Czernin at Prague, in the suburb Hradschin, built in 1670, has a basement about twenty-four feet high, of which the whole face is broken into projecting piers; and the piers and recesses alike are built of stone in high courses, every stone cut to a pyramid of considerable projection. Upon this basement stands an order four stories high, the engaged, composite columns resting each upon one of the piers of the basement, and carrying each a portion of the entablature in a *ressaut*. But in order that the fourth story may be lighted with sufficient windows, the entablature between the *ressaut* is entirely omitted except for the cornice, and some very irregular consoles which support it. Other and equally irregular modifications of the Composite order and of Roman style, even considered in the most liberal way, are introduced. Thus the old Exchange (die alte Boerse) at Leipzig, built about 1680, is faced with very flat pilasters which are panelled, and have a singular sculpture of laurel leaves in the panels and capitals bearing some semblance to late Roman Ionic capitals. This order is two stories high, and its entablature, as well as the panelled pilasters, is out of all custom and denies all authority. Even the strange double doorpiece seems not out of place in this tasteless composition. In contrast with these extravagant conceptions are the very plain buildings for which no porticoes nor other architectural decoration of the style could be allowed, and which have nothing but their mass to recommend them, lacking as they do almost wholly the charm of proportion. One of these is the great palace of

Schleissheim near Munich, which is devoid of this and all other architectural charm. The neighbouring country palace of Nymphenburg is equally uninteresting, but is also less pretentious. These structures, dating from 1665 and 1685, are specimens of the huge, dull, unattractive continental palaces of which some have been destroyed but many remain. They show the worst side of the classical revival, combining the most unattractive exteriors with suites of state apartments bedizened with tasteless and immoderate ornamentation. A good instance of the very uninteresting exterior, which though not extravagant is worse, that is to say, intolerably dull, is the Stadthaus or town-hall at Zurich,

FIG. 243. Zurich, Switzerland: Town-hall. About 1700.

built in 1694. Figure 243 gives a detail of this building. It may have been thought that a plain building was appropriate to a small republican canton, but the complete absence of picturesque or other charm is an evidence of the comparative difficulty of dealing with such structures of moderate size in the late neo-classic styles. The style is always tending either to extravagance or to dulness when its one decorative feature, that of the large Roman order, is taken from it; and there are few buildings in which neither of these tendencies can be seen to prevail. One such building, however, is the beautiful Rathhaus at Magdeburg in Prussian Saxony, which building was begun and finished during the last decade of the century. Figure 244 gives a part of this attractive building, in which no doubt minor faults can be found, such as the insufficient projection of the basement wall with relation to the order above, and which has, in its pediment, sculpture which would be quite impossible in a public building elsewhere than in seventeenth-century Germany, but which is still a gem of simplicity and fitness.

The principal palace of Berlin, the *Königliches Schloss*, was built nearly complete during the first fifteen years of the eighteenth century. It is a typical example of the uninteresting palaces so common throughout Germany and the adjacent lands. Here and there is a colonnade of four or, in the courts, of eight Corinthian columns, not badly proportioned, and here and there is a corresponding disposition of pilasters with the whimsical peculiarity that the pilasters are fluted, while the columns, though not of beautiful material, are plain. The courts, with their occa-

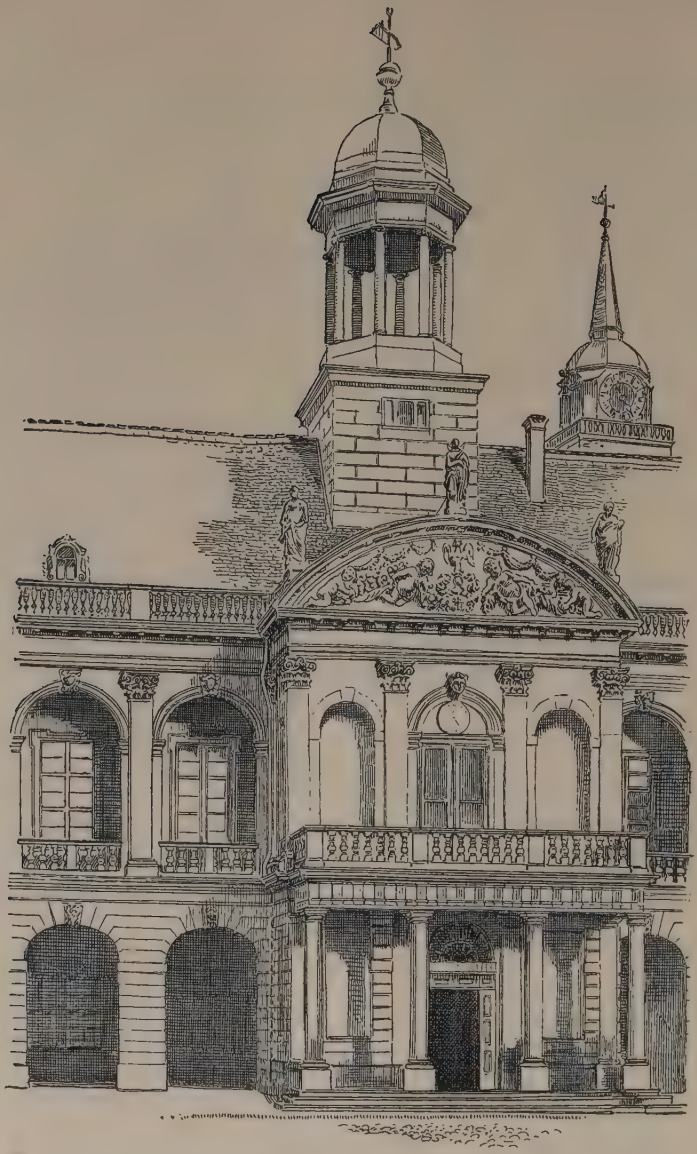


FIG. 244. Magdeburg, Germany: Rathhaus. About 1690 A.D.

sional arcaded galleries and with bolder colonnades, are more diversified with light and shade, but even here monotonous bigness rules. The exterior, with its long rows of ill-designed windows, its porches of columns too flat against the wall, and its cornice much too small in its details for its great height above the eye, is as unattractive as a building of great size and fine material can be made, unless by the intrusion of actually monstrous and offensive detail. The palace of Charlottenburg near Berlin is somewhat later. Its interior displays almost every variety of rococo decoration carried to extreme, but the exterior has a certain beauty of proportion which redeems it in spite of its impure detail. There is a colossal order, but only of two stories, and this is placed upon a very sufficient basement. The cupola on its high drum is a little heavy for the central building which it crowns, but is good in itself; an excellent specimen of the extravagant pseudo-Roman style of 1705. There is an old palace at Erfurt, once the residence of the governor sent by the Bishop of Mayence, and now used for some government purpose, in which rococo details are carried as far perhaps as they can be in exterior architecture. The pillars on each side of the great doorway are colossal telamones, the terminal pillars of which are set with an edge instead of a flat surface in front. Pedestals above, set in the same fashion, support the large scroll buttresses of the window piece, above which buttresses end in festoons of fruit, and support figures of about life-size in disorderly attitudes. The sills of the basement windows project only two inches, but they have the seeming support of console brackets which pro-

ject a foot, and the multifarious details of the exterior are all of this general character. This building is of about 1715. The match for this in absurdity of sculptured ornament both outside and inside is the old Palace Trautson at Vienna. Here, however, the great order above, and the basement below, have somewhat more dignity, and the sculpture is, therefore, less ruinous in effect. In the same city of Vienna, the highest reach of inappropriate design exists in the church of S. Charles Borromeo, begun about 1720. A very well-proportioned portico with six Corinthian columns and a pediment and a cupola on a high drum, perhaps not inferior to that of Charlottenburg mentioned above, are lost in a confusion of unmeaning adjuncts. The often criticised Zwinger at Dresden, of the same epoch, should be compared with such ill-conceived building as this, because the Zwinger is well and appropriately planned and distributed. It is, moreover, full of a fanciful grace in its minor parts supported by a really dignified sobriety in its principal mass. That principal mass is a structure of one Roman order studied from the Old Library at Venice, raised upon a rusticated basement; the two wings of eight bays each are divided by an entrance portal studied from a Roman triumphal arch and of the whole height of the structure. There is nothing *baroque* about that building except here and there a stray detail. The four pavilions at the corners of the great court are lighter in style, and with slender piers dividing enormous windows, so that they are filled with light, as those will remember who have studied the collection of casts from sculpture which they contain. The slight pilasters, the small spandrels, and the

narrow friezes are filled with delicate sculpture which would befit rather the interior of a theatre than the outside of a palace; but each one of these pavilions is a graceful and pretty building which one can pass day by day and not dislike. There are pavilions in the middle of the sweep to the east and to the west which are certainly more extravagant, and which it is not easy to defend. Finally, the long low gallery which encloses the great court on the southwestern side is as good a light corridor of open arches with a terrace walk on top as any palace can show. Certainly neither the architectural detail, nor the sculpture of human, animal, and vegetable forms is to be proposed as an example to students. The whole school of architecture which this represents is abnormal and artificial in the extreme. It seems to be based on the two contradictory theories that Roman columns and pilasters are alone admirable as the basis of design, and that these columns and pilasters can never be endured unless they are half concealed, and all their formal dignity destroyed by masses of unrelated sculpture. The Catholic Court Church at Dresden is a partial embodiment of this artificial style (see Fig. 245). It is the more fit for an example as it is well conceived in general masses and in the placing of ugly details, and free from such solecisms as the second story wall of S. Paul's in London, or the spacing of the Louvre colonnade, so as not to allow of any windows behind it (pp. 477 ff.). This building is as reasonable and logical as the Versailles chapel (see p. 482), however inferior in good taste. The very worst type of this false architecture, as the Zwinger is perhaps the best, may be found in the royal gate

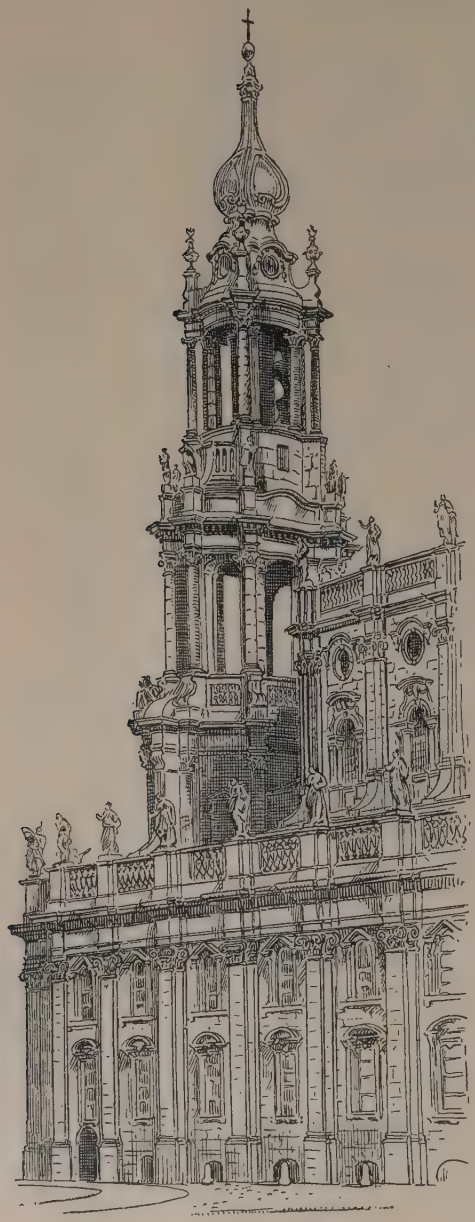


FIG. 245. Dresden, Germany: Catholic Court Church. 1740 to 1750 A.D.

(Königsthor) at Stettin, and this is curious in that a severe Roman Doric order was selected as the frame which was to support so ill-designed and inappropriate a mass of sculpture.

The finest interior decoration of the rococo sort, equal to anything in France, is to be found in the two great Rhine pleasure-castles of Brühl and Bruchsal. A splendid apartment in Schloss Bruchsal, once a palace of the Archbishop of Speyer or Spier, is given in Fig. 246. Brühl, a former residence of the Archbishop-Elector of Cologne, is in a way graceful in its exterior, as well. The

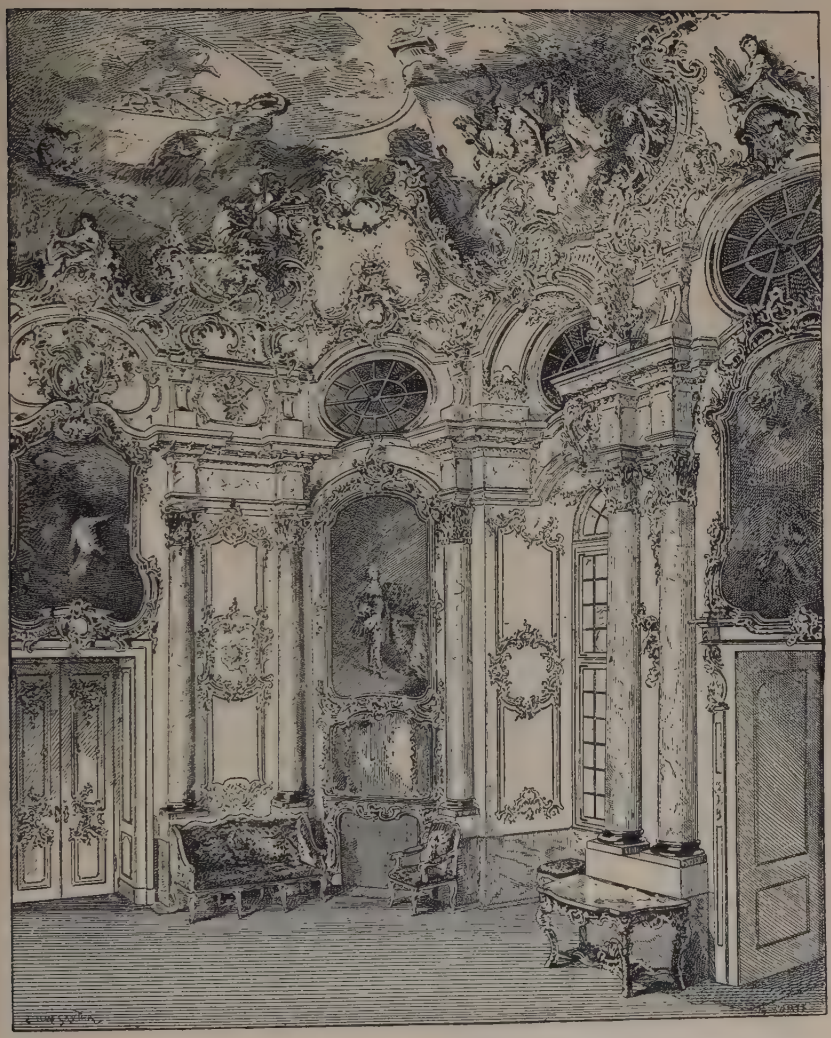


FIG. 246. Bruchsal, Germany: Palace of the Archbishop of Speyer. Saloon. About 1760.

garden-front, of 1725, is simple and not ill designed, and has a fine terrace and stairways, as well as a great deal of beautiful iron-work. It is a curious study to compare with this

really agreeable palace-front the overloaded exterior of the Catholic Court Church at Dresden of the same epoch. This latter building offers, along with its logical and workmanlike plan and construction, as badly managed a colossal order and as ugly windows as can be found in any seriously planned building in Europe (see Fig. 245). As for

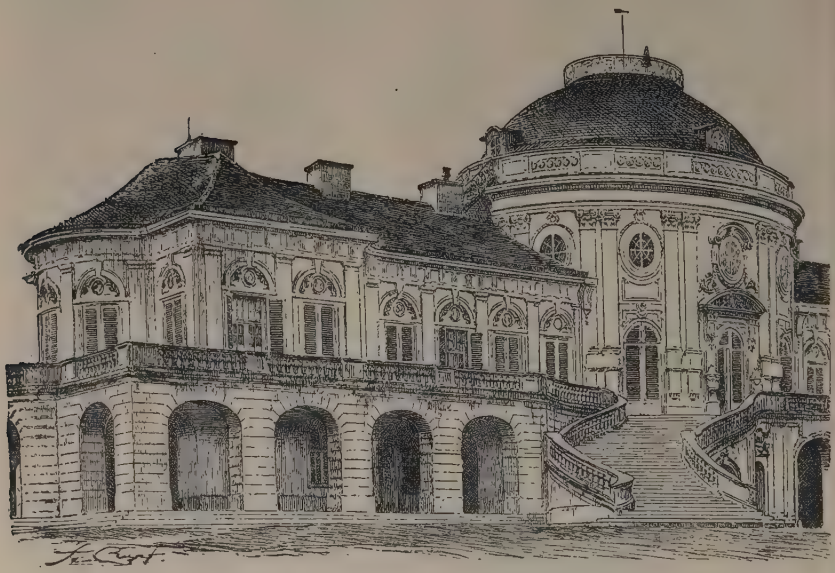


FIG. 247. Stuttgart, Germany: Palace called Solitude. 1767 A.D.

the palaces, a great number were built in German lands during the years 1700–1750, for it seemed as if every prince and princeling felt the need of vying with King Louis at Versailles. The poorer or the less ambitious sovereigns built the expressionless and meaningless palaces of which there has been mention; but such buildings as that of Brühl and that of Charlottenburg were also

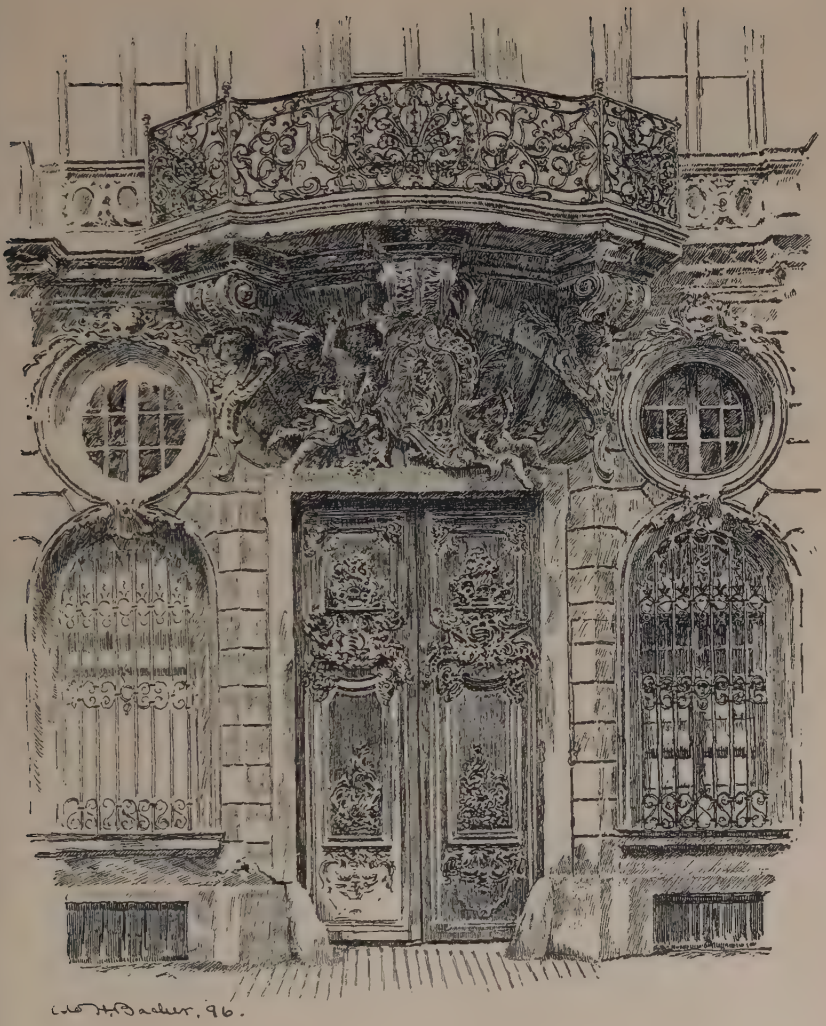


FIG. 248. Munich, Germany: Street-front. About 1760 A.D.

built, and it is necessary to mention the extraordinary collection of stately eighteenth-century structures at Potsdam. This town, ten miles southwest of Berlin, has first

the Stadtschloss, or town-palace, then the new palace in the Park, with its really extraordinary annex of the "Communs," or offices, and its orangeries and summer-houses: then the villa called Charlottenhof; and finally the palace of Sans-Souci. These are royal palaces; besides these there are public buildings in the town dating from the first half of the eighteenth century and very interesting, at least when taken together; and some rows of private houses of about 1775 are fit to rank with the palaces in the stately effect of their long façades. Probably in all this world of grandiose architecture the best designing is in the New Palace, so called, built by Frederick the Great about 1760. It is not splendid in material or interior fittings, but it was a skilful architect who dealt with these open colonnades and high-raised porticoes. The front on the court and facing the offices is one of the best instances in Europe of a colossal order occupying the whole height of the building, without any architectural basement whatever. The small country palace called *Solitude*, not far from Stuttgart, is shown in Fig. 247. It is as late as 1765, and should be compared with the Rathhaus of Magdeburg seventy years earlier in date (see Fig. 244). A good specimen of the most elaborate rococo decoration applied to a street-front is the detail shown in Fig. 248 from Munich.

IV

King Charles II. returned from the continent and began his actual reign in 1660. Whatever hesitation about building there had been during the Commonwealth and

the Protectorate disappeared with the Restoration, because there was no longer a visible possibility of a change of government. The Archbishop of Canterbury began at once to rebuild Lambeth Palace, and erected the great hall in a most incredible mixed style. Gothic windows with tracery and buttresses with weatherings fill the wall-space, but the wall is crowned with a classical entablature which breaks around each buttress, and this entablature is capped by a pediment at each projecting wing. The notes issued by the Society for Photographing Relics of Old London mention this as showing Archbishop Juxton's obstinate preference for the older Tudor Gothic of the rest of his palace, but it has rather the air of a piece of reparation; the wholly new parts made classic. Amesbury House in Wiltshire was built by John Webb in 1661, and the central portion of Cobham Hall in Kent was built in 1662, and these two buildings are absolutely classic. The fault of these two buildings is not in being too fanciful; they are dull; they lack interest. At Cobham, for instance, four Corinthian pilasters carry an entablature, and between the two middle pilasters is a classical door-piece. All this is very good and pure, but there is nothing else. Twenty-seven plain windows in three stories are pierced in a blank brick wall; they are regularly formed and spaced; there is nothing to offend; all is tranquil and refined, but it is not architecture. Nor would such a plain building be named but for the mention it receives as typical, and for the fact that it really does typify this peculiarity of English work at this time; namely, that the classical teaching on the one hand and the Gothic tradi-

tion on the other were still so much in a position of antagonism that anything non-Gothic, and with a fragment in it of Italian detail, would be at once accepted as sufficiently good classical art. It must not be forgotten that the Italian Renaissance had never been received in England. When classic forms came in, they were those of the Cinquecento, the completed and regulated style of Vignola and Palladio. Palladio's books and his example were of especial weight in England. There was therefore no graceful and playful architecture of classical type or of classical origin offered to the English in 1665. If an English country gentleman wished to build, he had the alternative between a traditional Elizabethan or Jacobean style, such as country builders might still have been capable of, and the Palladian classic style offered him by such architects as John Webb, Sir John Denham, and Christopher Wren. But this last-named style has this peculiarity (see p. 460 ff.), that it can do nothing except by means of colonnades, or, at the least, of an order of pilasters. An inexpensive building must needs be uninteresting. It is therefore only the later Italian neo-classic, as practised by the architects named above and their successors, which ought to be considered in dealing with the architecture of this epoch. There are, indeed, the singular Gothic attempts of different architects, such as the church of S. Dunstan in the East, and the western towers of Westminster Abbey, but these are of no importance in the history of architecture.

In 1666 was the Great Fire of London, the most complete destruction perhaps that has ever befallen a large

town except in ancient warfare. Immediately after this there came the rebuilding of S. Paul's Cathedral, and the erection of a host of churches and other public buildings,

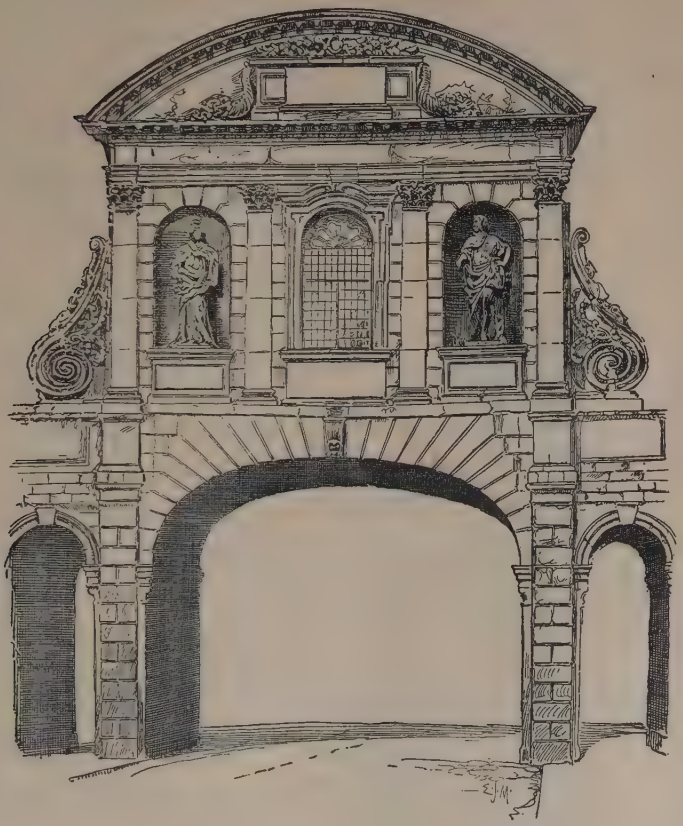


Fig. 249. London: Temple Bar. 1670.

and in all this business Christopher Wren took the largest part. Temple Bar, which represented the old city gate at Fleet Street, and which was taken down in 1878 for unknown reasons, was built by Wren in 1670. Figure 249

shows its western front. No small building gives a better idea of Wren's design. Indeed, it is not often that he had an opportunity to build a small building entirely of cut stone and in an elaborate style. The churches were built hastily and at slight expense, and it is one of Wren's claims to our admiration that he built these churches of considerable size at very small cost. The best part of them is probably their steeples, and yet even these are unfortunate in this respect, that details entirely foreign to the Roman style adopted, are allowed to invade the design. Thus in the celebrated church of

FIG. 250. London: Church of S. Mary le Bow. Steeple finished 1677 A.D.

S. Mary le Bow in Cheapside, the steeple is certainly good in general proportion (see Fig. 250), and the transition from the square tower to the circular peristyle is well managed and is agreeable both in front and when seen anglewise, but the pinnacles which fill the corners of the square tower are of ugly form and flanked by meaningless scrolls, the reduction in size to the smaller peristyle above is managed by the most awkward, thin, and flat flying buttresses, and the terminating spire is an obelisk with valueless details about its base. There is a degree of incongruity in these architectural details which no beauty of general proportion can redeem. It is probable that Wren's lack of early and lifelong architectural training — for he was a mathematician and astronomer, and a scientific constructor rather than an architect in his tendencies — told heavily against his success in these rapidly designed and hastily constructed buildings. An architect by early teaching would also have been more unwilling than Wren to roof metropolitan churches with lath-and-plaster sham vaulting — at a time, too, when the French architects whose work he had studied were turning vaults of solid masonry. At least it is certain that the steeples of his successors, especially of James Gibbs, are often superior to Wren's, as they are perhaps equal in general excellence of proportion and are more free from the serious faults of inappropriateness and lack of harmony of parts.

S. Paul's Cathedral is in its interior a church of unquestionable beauty and merit. The plan of the existing church was not, as it appears, Wren's choice, but it is

every way excellent for interior effect. The great octagon formed by eight piers, and from which spring the arches which carry the dome, is a singularly skilful piece of planning, and the circle of the drum beneath the cupola grows out of the octagon below insensibly and with the support of arches whose lightness is surprising. The interior cupola itself springs from this drum, which is not strictly cylindrical, but slightly conical, the walls and the order of pilasters which are so effective when seen from below having alike an inward slope (see Fig. 251). Except always S. Peter's, there is no interior of a cupola in Europe which is more beautiful and which combines better with the church. The nave and aisles are roofed with low and flat cupolas, each of which is carried on pendentives of unusual sort. In the nave the cupolas are as wide as the width of the bays in the direction of the length of the church — that is to say, east and west; but as the compartments of vaulting are oblong, there is a commencement of a cylindrical wagon-vault which forms a lunette on each side and receives the clear-story window. In the aisles the reverse arrangement exists, the compartments having their greater length in the direction of the length of the church. The whole interior is marked by an admirable proportion between the work to be done and the means offered for doing it. The student is not driven to long for Gothic lightness, accepting this as of a different kind of building; and assuredly this is not equally true of the important continental churches, — even of such good ones as S. Roch in Paris (see Fig. 215). Of the exterior it is less easy to speak without reserve. In

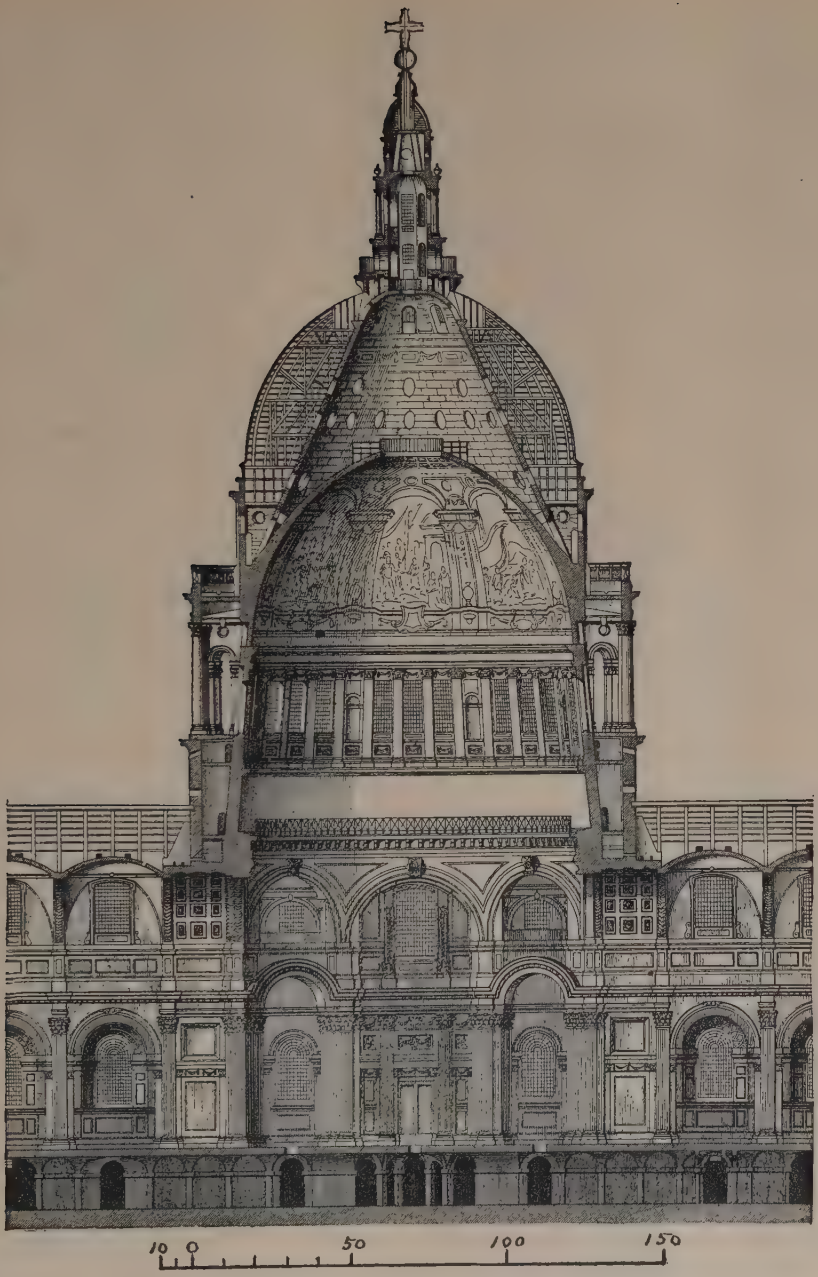


FIG. 251. London: S. Paul's Cathedral. Partial section. 1680 to 1710 A.D.

the first place, the observer must puzzle out the meaning of the high outer wall along each flank, which wall is divided architecturally into two stories with a very beautiful order of Corinthian pilasters for each story. A moment's comparison of this with the interior shows that the height of the aisle within corresponds with the lower story of these two. Of the whole height of the upper story, about one-quarter serves to enclose the garret between the aisle vault and the roof timbers above, which garret would form the triforium in a Gothic church, and which in S. Paul's is masked on the interior by a feeble row of panels (Fig. 251) above the nave arches. The rest of the outer wall stands clear, a mere screen, hiding the clear-story windows from without, and enclosing nothing but an open area at the top of the building. This is so great a solecism, so barbarous a device, that a stickler for reasonableness and naturalism in architecture might condemn the exterior at once as unworthy of notice. Indeed, the flanks are, as to their design, not architecture, but scenic decoration. If one studies them, it must be as a piece of abstract architectural designing; a study of what would be good to do if one had a large and long two-story wall to treat — a palace-wall, or the like. From this point of view an exterior such as that of the chapel of Versailles (p. 482) is not only superior but of a wholly different world; that is really architecture; and fine as are Wren's two orders, they in themselves are not different from what one can find widely distributed over Europe. What is really fine, as being at once beautiful in proportion and in detail, and as coming directly from the plan

and build of the church, is the west front. Here the nave in its upper part — that is to say, the clear-story — is thrust forward to form a portico of Corinthian columns with pediment; and in the lower story the nave and aisles together, for the whole height of the aisles, unite to form a broader portico. The whole width of nave and aisles, which is the whole width of the lower portico, is held between the two belfry towers, and the order of the porticoes is continued across these towers and all around the church, but in pilasters instead of columns (see Fig. 252). But the front porticoes are even more admirably adjusted to their place and their requirements than the above description fully explains. Thus the upper colonnade of eight columns in couples has its columns centred upon the lower colonnade of twelve columns in couples; and, to retain the accepted classical proportions, the two porticoes are of nearly the same height. The outer columns of the lower portico are on the axes of the corner pilasters of the bell-towers; the outer columns of the upper portico are on the axes of the pilasters which represent the front of the clear-story wall; between this upper portico and the bell-tower is a recess with windows which quite accurately corresponds to the open area above the aisle, and which closes a small chamber built above the western end of the aisle, leading to the staircase in the bell-tower. All this is brought together with but the very slightest forcing of the plan. There is nowhere a more perfect piece of adjustment and judicious building in any neo-classic style, and if there are anywhere examples of more subtile and refined proportion, they are probably struct-

ures which required no difficult adjustment to a complicated building. The cupola of S. Paul's Cathedral is composed as follows (see Fig. 251): the conical drum mentioned above carries an inner masonry cupola which is about one hundred and five feet in diameter and is not hemispherical, but built with a section which would be a pointed arch but that an opening twenty feet in diameter is made at the summit. There rises from the solid masonry at the abutment of this inner cupola two structures, first an outer ring-wall, which is adorned with pilasters and rises about thirty feet, and an inner cone of masonry which carries the lantern. The dome that is seen from without is, like the dome of the Invalides, a fabric of wood covered with lead, and this elaborate piece of carpenter work is built up upon the ring-wall mentioned above, and which forms the outer *tambour* or drum of the dome, and upon the masonry cone which it conceals. Here, as in the Invalides, not only are the inner and the outer domes distinct, but the outer dome is not even seen from within the church, and no such cupolas as these ought to be compared in any way with such cupolas as those of Florence and Rome or those of Constantinople and Bijapur. But the brick cone of S. Paul's has an enormous and heavy stone lantern to carry, while in the case of the Invalides the lantern also is of carpenter work like the shell of the dome. The lantern at Florence is as high as that at London and apparently heavier; the lantern of S. Peter's is as high and broader and is undoubtedly heavier; and these vast structures, each as high as a seven-story house and more massively

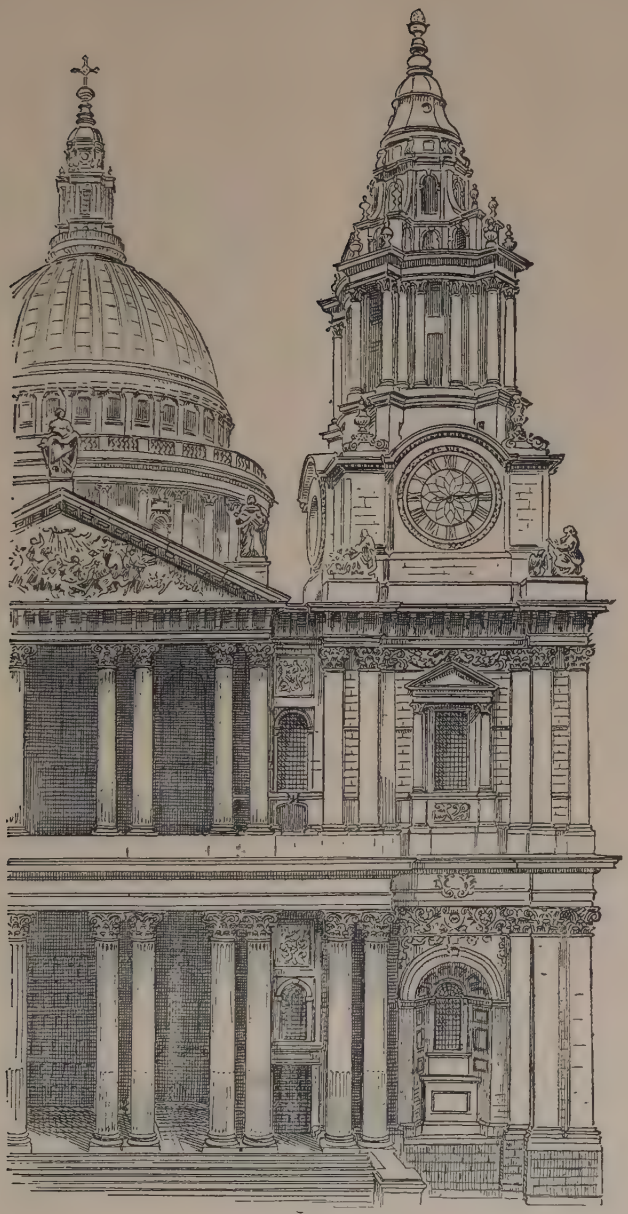


FIG. 252. London: Cathedral of S. Paul. South part of west front (see FIG. 251).

built, are carried by the bulging wall of the dome. That Sir Christopher Wren was unwilling to undertake such a task as this was perfectly natural; and knowing what we do of his mathematical and constructional knowledge and his remarkable power of fitting himself for any task he might undertake, we are led to the conclusion that he was influenced by the considerations of expense and by the consideration that he was about to surpass in thoroughness of build, as well as in size, the church of the Invalides, a special monumental structure just finished by the superb king of France.

Another stately building is the work of Wren: so much of Greenwich Hospital as is included in the two southern or inshore buildings. These have very noble porticoes of coupled columns and two cupolas as finely designed as anything in the style. Another, and from the point of view of stately designing perhaps the finest, is that part of Hampton Court Palace which was built for King William III. The front is dignified and is unusually interesting as a design in spite of its simplicity, and the court front, which has three stories of windows above an open arcade with square piers, is one of the best compositions which can be found in Europe of a flat wall pierced by many windows. It is in these buildings rather than in the minor London churches that Wren's remarkable ability can best be judged. It would have required a genius of unexampled power and range, and a lifelong devotion to the one business of decorative building, to have been successful with forty churches undertaken all at once and all inexpensive. This task, which would have been of extreme difficulty in

any style of architecture, was made almost hopeless by the necessity of conforming to the grandiose style of Vignola and Palladio.

Several private mansions of great size and of considerable merit were erected in England during the early years of the eighteenth century. The main block of Chatsworth in Derbyshire dates from this epoch, the design having been settled as early as 1690. It is seldom that a building with so little variety in its principal masses is so successful. The river front and the two great fronts which adjoin it are almost without projections to throw shadows, or differences in height to break the skyline. The northern front has indeed a rounded tower-like centre rising a little above the other levels of the building, and this must have been successful in giving a charm to this front before the unlucky north wing was added by Wyatville in 1820. The south front has only two very slight breaks recessing the centre by a foot or two. The west front with its portico and richly decorated pediment is very effective, except that the basement on which the engaged columns rest greatly needs more solidity and uniformity; it is broken in the middle for the doorway and is thus made thinner and lighter, instead of more massive in appearance, than the basement of the pilaster order elsewhere. The order, pilasters and columns alike, is Ionic on the south and west fronts, and this order includes two stories of windows. The rounded projection on the north front has an order of Corinthian pilasters and is higher than the Ionic order so as to contain three stories of windows. There is one thing to be mentioned in the exterior of

Chatsworth, — the rather free use of sculpture in the west pediment, the frieze and around the windows under the pediment in the guise of pendants seconding and enclosing the architraves. The late neo-classic in England as taken from Vignola and Palladio is almost without such decoration, but a few instances remain of somewhat elaborate sculpture, and it is interesting to see this attempt to enliven the narrow-minded severity of the stricter style. There remains in the heart of London a house, No. 73 Cheapside, which exhibits similar decoration of a very good quality. This front has been published by the Society for Photographing Relics of Old London, and is an interesting subject for study.

In Castle Howard, Yorkshire, built between 1702 and 1720 by Vanbrugh, the larger and more stately country mansion is completely typified. In this building, too, there is a great deal of sculpture, but confined to the central mass; this sculpture, however, is greatly inferior in tastefulness and beauty to that of Chatsworth. As regards the main features of the design, the front of principal approach is made up of two wings brought far in advance of the main building and of only half its height, and plain in treatment, even to nakedness, and of the central building itself which has a colossal order of pilasters Roman-Doric in style, and a doorway and porch of entrance with Ionic columns. This central building repays close examination. The pilasters are arranged in couples, and each couple carries a *ressaut*, the frieze of which has its triglyphs, though these are absent from the recessed walls between. The windows are all in these recessed walls, and the en-

trance doorway and porch with the large window above it is also in such a recess. The narrow pieces of wall between the coupled pilasters are occupied by niches with statues and decorative vases. The whole design is very unusual, and, except that the windows in the side recesses are too crowded, very successful; the view of it amounting indeed to a new and pleasant experience to the student of the late neo-classic. The park front of Castle Howard is as flat as the opposite one is boldly diversified. This park front embraces the main building, which has been described above as Doric on one side, and which is Corinthian here, and of two wings one story high and also Corinthian. The central mass carries a very well-designed cupola which is equally visible in either front, and which helps in the easy recognition of this central building as one and the same, though with its two façades very different in treatment. The wings and the centre of the park front are treated alike, each with a Corinthian order of the whole height of the wall. These two orders are therefore very different in scale, the one having less than two-thirds the height of the other. This has been objected to as an impropriety, but it is easy to see that it is in conformity with the practice of both the Greeks and Romans of classic times. A large Greek temple and a small Greek temple had each its columns and pilasters, and indeed its whole order proportioned to the building (see Chap. I., Sec. I.), and at Pæstum, at Akragas, and at Syracuse these large and small buildings stood near together, as indeed they must have done wherever there were more temples than one. Moreover, the interior of a large Doric

temple was divided by rows of Doric columns, a larger row below and a smaller one set upon it, so that the Parthenon contained three Doric orders designed on three different scales. The Propylaia at Athens has two Doric orders on different scales in the western front (see Fig. 8). The great halls of Roman thermæ were similarly adorned, and with Corinthian orders (see Fig. 29). Authority and example are in favour of the architect of Castle Howard. As to good taste, that is another matter, and the lover of beautiful architecture would certainly prefer the renaissance device of an order to

FIG. 253. London: Church of S. Mary le Strand. 1717 A.D.

each story, the lower order probably stretching across wings and central pavilion alike.

Parts of the interior of Castle Howard are very stately, especially the entrance-hall with a huge Corinthian order carrying round arches and vaulted ceilings; but it is, of course, impossible to say how much of this is masonry, — whether the vaulting is not a plaster shell hung from a wooden roof above, as was too commonly the case. A still vaster palace for a nobleman was built by Vanbrugh, the house of Blenheim, presented by the nation to the Duke of Marlborough. It is much less successful than Castle Howard.

James Gibbs was practising as an architect from about 1710 until his death in 1754, and most of his important work has value. The building best known is probably that shown in Fig. 253 — the church of S. Mary le Strand in London, standing where The Strand and Holywell Street meet, at an acute angle opposite Somerset House. The neighbouring church of S. Clement's Danes, also in the middle of The Strand, had been built by Sir Christopher Wren, but the steeple is by Gibbs, and is a very successful design in one of the most difficult of styles for a tower. This tower stands, too, on the ground, a virtue not always existing in the churches designed by Gibbs. S. Martin's in the Fields, opposite the National Gallery, also by Gibbs, has, like S. Mary le Strand, a tower which does not stand upon the ground. In this case it is set upon the roof of the porch. This, however, is not an uncommon fault in London churches; S. Giles' in the Fields and S. Leonard's Shoreditch have high towers

standing upon the church roofs, and S. George's, Hanover Square, has a somewhat lofty cupola in the same position, that is, immediately back of the portico and serving as the church tower. Gibbs' other works are less known except, perhaps, two really beautiful buildings: the Senate House at Cambridge and the Radcliffe Library at Oxford. The building at Cambridge was erected about 1725, and, as it still exists, is but one wing of a much larger proposed structure. It is a very simple and well-designed building, with a colossal order and two stories of windows. The Radcliffe Library, built about 1740, is a rotunda with an exterior order of engaged Corinthian columns, and having a lofty cupola. The chief mass of building has two stories above a basement, and above these is the entablature of the order, and a parapet with a flat roof behind it, from which rises the drum of the cupola exactly as the tower-like nave of a round church rises above its aisles. It is a manly design, and one of the best classical buildings in England.

The English architecture of the reign of George II. and of the earlier years of George III., or from 1727 until about 1780, is homely, generally unpretending, dealing rather with interiors than with showy façades, and inspired by a certain picturesqueness of detail which makes the stair-cases, mantels, ceilings, and other work in wood and plaster singularly attractive. This same architecture was transplanted to America and there reproduced under different conditions, a great deal of the would-be classical detail being worked in pine wood, planed, turned, and carved into a semblance of stone architecture. The

varied woodwork of the interiors was even more free of classical influence than in England at the same time, and the exposed timber framing, planed and chamfered, shows lingering mediæval tradition. This is what is called in the United States Old Colonial architecture, and it has a great attraction for modern designers of simple dwelling-houses. The same, and a still greater charm, is to be found in the English buildings which still remain unaltered, which buildings are sometimes the work of the architects, Nicholas Hawksmoor and John James, for the earlier reign, and John Carr, Sir William Chambers, and the brothers James and Robert Adam, for the years succeeding 1750. Wood-carving had been raised to a noble fine art by the genius of Grinling Gibbons, who died in 1720, after having adorned S. Paul's Church in London, Canterbury Cathedral, and very many private houses of his time. Sculpture in marble of his exists, which has great merit; but the peculiar reputation that he gained is founded upon his decorative woodwork. Although Gibbons left no successor at all his equal in ability or reputation, he had founded a tradition which remained of force until very recent times. The wood-carved interior fittings of the time, and even some exterior doorheads and the like, are full of vigorous life, which shows how strong were the traditions among the more skilful workmen, and how closely those traditions succeed, without a break, from the English sculpture of the fourteenth century. The most important building of size and dignity which was erected during those years is Somerset House, in London, fronting on The Strand and also on the Embankment.

FIG. 254. London: Somerset House. Vestibule. Begun 1776 A.D.

The central mass of the present great structure was built from the designs of Sir William Chambers. The general character of the design is not different from that of a vast number of public buildings erected during the two

centuries preceding its beginning. A Corinthian order is set upon a rusticated basement, and two or three stories of windows are put in between the columns. Figure 254 shows the entrance vestibule of Somerset House, a really fine work of its class. Old Burlington Gate, which men not old can remember as standing on Piccadilly, where the Royal Academy now has its entrance, and the Royal Society and other important associations are housed, was a structure unusually free and vivacious for the time. The design is claimed for Colin Campbell and for Lord Burlington himself. Other interesting buildings were built under George III., but the external architecture of the time is unhappily identified with the long rows of stucco-fronted houses on Portland Place, Stratford Place, Hamilton Place, Mansfield Street, and the like. The maxims of Vignola and Palladio had been followed almost without question by three generations of architects. The obedience to these narrow rules had been the ruin of architecture as a living art, except where it had been clearly impracticable to apply them. A staircase might retain its twisted balusters and carved newel, but the exterior of the house must have an order of pilasters with a basement to support them, whether these forms were made of stone or plaster; or, failing this, the front was not to be architecture at all, but a flat, smooth surface pierced with rectangular holes.

V

The neo-classic architecture had exhausted all its combinations in Italy before 1665. Those varieties of it which Italians could use had all been used. Every peculiarity of detail and of arrangement which the traditions of the Italians and their natural feeling as southerners and heirs of antiquity would admit had been tried. The picturesqueness of German work of the sixteenth century it would never occur to an Italian to try: he could only think it a foreign thing, not for him. The elaborate refinement of French work, such as that of Lescot and Bullant, fanciful and yet delicate detail added to a highly organized structure, was not in his way. What the Italian could do and would wish to do he had done before 1665: as is proved by the fact that he has done nothing different since that time. That date has indeed no especial application to Italy; it is fixed for our present epoch by the events of France and England: but even an earlier date would serve to fix as of the time when the Italian genius had worked out every available form of neo-classic architecture.

The colossal order as used in the apse of S. Maria Maggiore of 1673, in the front of the Lateran basilica at Rome of 1735, in the front of S. Maria Maggiore at Rome of 1743, and in S. Barnaba of Venice of 1749, is not different in any essential way from the order and its use in S. Giustina in Venice of 1680 or S. Andrea at Mantua of 1480. The use of colossi in the way of telamones, appar-

ently a very marked piece of *decadenza*, is not very different in the villa at Stra on the Brenta of 1780, or in the Palazzo Durazzo-Brignole at Genoa of 1700, from the use of the same device at Milan in the Pazzi Palace, a building ascribed to Leone Leoni, who died in 1585. The church of S. Fosca at Venice is but a lighter S. Lorenzo of Florence: though the Florentine church is the earliest of all renaissance buildings (see p. 369), and the Venetian one is of 1745. The Venetian Palazzo Grassi of 1718, on the left as you ascend the great canal (see Fig. 255), has but the same disposition of orders in its façade as a hundred street-fronts of earlier centuries: it is only a little colder and harder than work just two hundred years earlier in date. The same may be said of the Palazzo Flangini, the Palazzo Corner della Regina, the Palazzo Pesaro, — all on the same great waterway, and of different dates from 1670 to 1740. The rustications, the banded columns, the modification of the entablature of an order to fit a whole front with several orders in its height, the decoration of the window and door openings by pediments, columns, brackets, etc., the use of arcades and all the different forms of arcade that could be thought of, — everything, in short, had been tried that was compatible with the simple flat wall and low-pitched roof, and with the tower and cupola in their southern forms.

There was no system of construction peculiar to the neo-classic art, and therefore there was no steady development from style into style, whether slow, as during the Byzantino-Romanesque epoch, or swift, as from 1160 to 1300, in France and the neighbouring lands. Develop-

ment in the proper sense there was not: each able artist thought of one or two new devices, by means of which the ancient Roman forms might be more easily reconciled to modern requirements. In fact, there was

FIG. 255. Venice, Italy: Palazzo Grassi. Begun 1705 A.D.

no moment, after the first announcement of a classic revival in Florence, about 1425, when all Italian builders were working in a traditional way, a spontaneous way. The nearest approach to it was the Lombard period, from 1475 to 1490 or thereabouts, the time when S. Maria della Grazie was building at Milan, and the exterior of the Scuola di S. Giovanni Evangelista at Venice. Strangely enough, it is precisely this one form of neo-classic which the later Italians never used. The pilaster with arabesques in a sunken panel, the larger panel of similar sculpture set freely in the wall, the disc of coloured marble, the light porch with slender columns, the *fronton* which kept no resemblance to the antique pediment, but was high and open and filled with sculpture in relief, — these and the like were avoided by the later architects. Except for such brief moments as that one, — if indeed there were other such moments, — any Italian architect felt himself free to design according to his own notions of how the ancient Roman should be modernized. This state of things lasted for three hundred years, or roughly from 1489 to 1789, the close of our record.[1] It is indeed possible, in most instances, if not in all, to determine the

[1] It was in so far a premonition of nineteenth-century work that each designer worked over his drawing-board, making his own designs regardless, or nearly so, of traditional way of work. Each man was an artist, and elaborated his own work of art, being no longer a master-builder overseeing other builders in ways familiar to him and to them.

During the century which has followed 1789, the Italians have still been working in one or another form of neo-classic, and, as before, in all forms of it at once. In this their practice has been very different from the French, the Germans, and the English, who have been busy with bold experiments and show wide divergencies of style.

age of a monument within a half-century, from its design alone; but in many cases this is only possible after a somewhat minute study of its mouldings and sculpture.

Is not this an ideal condition of things? Is it not well that there should be no important changes toward, and that each man should be free to design as he finds it easiest and most natural? It might be so in a different world of men; in the world which we know best, healthy life has never been separated from growth and what we now call *evolution*. Painting can be seen to be going on through regular evolutionary changes from school to school, from mood to mood, from fashion to fashion; and painting is now alive, a living and struggling art. Architecture is not exactly alive; as a fine art it is not alive; what is doing in architecture cannot be compared, as to its fine-art side, with what the painters are doing, or the sculptors, or those who are working in artistic pottery, or those who are making windows of stained and painted glass. So far as we know, it will only be when the architectural designer stops copying consciously this or that style of past times that he will produce anything worth having. In other words, it is only when each designer feels free no longer, and begins to work under the influence of his neighbours and contemporaries, friendly rivalry and eager jealousy alike spurring each man to vie with and surpass his fellows, but always in the same line of work as near as he can bring it out, — it is only then, when the artist is fettered, that art will be free.

The history of Italian architecture from 1665 to 1789 is a history of repetition and copying, and, as it were, a re-editing and reissuing of old texts. Here and there some-

thing very novel was done, when a very novel demand was made. Thus the epoch begins with the immense porticoes

FIG. 256. Rome: Colonnade of Piazza San Pietro. Begun 1667.

of the Piazza San Pietro at Rome; and assuredly the designer of those colonnades and corridors deserves credit for its plan, if the design of the order is but poor and me-

chanical (see Fig. 256). The oval place of S. Peter is about six hundred by nine hundred feet; this is level and is half surrounded by the two quadruple colonnades, open on every side and consisting of an uniform Tuscan order. From this oval the ground slopes steeply upward toward the entrance porch of S. Peter's Church, and this sloping part of the place is contained between the two enclosed corridors. Such a framing in of the open space in front of the church was extremely well imagined in view of the heterogeneous character of the buildings around it. Even the Papal Palace on the right, as one faces the church, presents a confused mass of buildings with but little architectural character. Bernini's porticoes shut out all these incongruous elements of the view, and the very coldness and formality of the design may be considered necessary in connection with the cold and formal church front of Carlo Maderno.

A serious attempt at original treatment of palace interiors was made by Vanvitelli (van Wittel of Utrecht) in the royal palace at Caserta, near Naples. The chapel is, indeed, in many ways an echo of the chapel at Versailles (see p. 482); but we have seen reason to think that the interior arrangements of the last named are extremely fit for their purpose, and such partial reproduction as is visible at Caserta does not exceed the proprieties of design. More novel is the bold and well-imagined entrance-hall with corridors leading off in different directions, and opening upon courts and gardens. Originality there is; but good taste, restraint, a perfect understanding of the style, there are not. Good taste and a strong sense of the

proprieties of the style chosen are precisely what the epoch lacks.

The villa Belgiojoso, on the south side of the Public Gardens at Milan, and occupied since the Napoleonic conquest as a palace for the sovereign and his family, was erected about 1790 by Leopold Pollak or Polack. In this building there is seen some of that return to simpler early forms which constitutes what is called the reaction against the Barocco. This tendency is, of course, akin to that love of simpler forms which, in France, is characteristic of the epoch of Louis XVI. Neither in France nor in Italy, however, can the chronological limits be determined with any certainty. The characteristic of the time is lack of refinement; and this is shown alike in clumsiness of general design and in excess and vulgarity of detail. This lack of refinement, indeed, never reached in France very great extravagance, at least in exterior design, but still the reaction under Servandony and his followers (see p. 493) is very visible. In Italy there really was a reign of bad taste, against which there was reason enough to rebel. The villa Belgiojoso, though late and corrupt in the details of the order, and with little merit in the sculpture, is of large and dignified design in its general masses. The front is divided, as regards its extreme width, into seventeen bays: of these, five bays form the central pavilion with projection only sufficient to introduce a single additional column in the return wall, and at each end three bays form an end pavilion with a pediment and with a projection equal to one bay. The whole front, pavilions, recesses, and returns alike, is made up of a

colossal order of two stories resting upon a rusticated basement.

The eighteenth century was not, however, a time of artistic excellence in Italy. Churches, as well as private and civic buildings of this epoch, exist in sufficient number, but they have little value for the student, being almost universally the repetition of old thoughts and old conceptions which had done their proper work long before.

GLOSSARY

Abacus (pl. **Abaci**). — The uppermost member of a capital. In Grecian Doric it is a plain square slab; in all other orders and styles it tends to be more or less ornamental. See Fig. 10.

Agora. — In Greek cities; an open place, often the market-place. It corresponds nearly to the Forum in an ancient Italian town.

Aisle. — In a basilica or a church of the middle ages or of more recent times, one of the side divisions, as distinguished from the middle division, which is usually wider and higher. In a cruciform church the nave, the choir, and the transept may have each its own aisles. In some churches there are two aisles on each side of the high middle part, and in a very few there are three aisles on each side, as in Antwerp Cathedral; see Fig. 157. In a few small churches, there is an aisle on one side of the nave only. Cf. Choir, Clear-story, Nave, Transept, and see the plans and sections of churches in Chaps. III. to VII. In a round church the outer and lower division encircling the high central part is considered the aisle. See Figs. 61, 62, 63, and 70.

Ambulatory. — A passage-way for foot passengers, usually covered and enclosed; especially when architectural in character and forming part of a building.

Amphiprostyle. — Prostyle at each end; said especially of a Greek or Roman temple. See Fig. 6.

Annular Vault. — See Vault.

Annulet. — A small moulding; especially in Grecian Doric, one of several projecting mouldings at the base of the echinus. See Figs. 11 and 12.

Anta (pl. **Antæ**). — A solid pier built at the end of a wall to give it stiffness. In Greek and Roman architecture it is generally treated as a pilaster. See Fig. 8.

Anthemion. — An ornament formed like a group of flowers, leaves, or the like, springing from a common point or from a short stem, and generally formal and symmetrical, so that an elliptical or similar curve would bound it. The most familiar instance is the honeysuckle or palmette ornament used in the Corinthian Ionic styles.

Antis, In. — Between antæ; said of columns or of a portico, and by extension, of the whole porch or vestibule to which such columns belong. Thus, in Fig. 6, the two porticoes are *distyle in antis.*

Aphrodite. — In Grecian mythology the goddess of love and beauty. The Italian deity Venus was identified with Aphrodite by the later Roman writers. Thus in Homer, Aphrodite is the mother of Aineias; and Virgil, while latinizing the latter name as Aeneas, calls the hero the son of Venus.

Apollo. — In Grecian mythology the god of poetry and song, also of healing, and often identified with the sun. The Romans took this deity into their Pantheon without trying to identify him with any Italian god.

Apse. — A projecting room or wing of a building having its plan rounded or polygonal at the outer end. In the early Christian churches an apse at one end generally contained the bishop's throne and the seats of the clergy, and sometimes the high altar. In later churches the apse is a mere curved ending of the choir, not often used in England but commonly on the continent. Some churches have several apses. See Figs. 33, 34, 55, 58, and 60. Cf. Triapsidal.

Apsidiole. — A small apse; especially an apse projecting from a larger one, as where chapels project from the larger apse of the choir. See Fig. 76.

Apteros. — Without wings; said of a personage to whom wings are generally ascribed. Nike Apteros, the wingless Victory of the Greeks, perhaps to be identified with the goddess Athene, when appearing as a personification of Victory.

Arabesque. — A piece of decorative scroll-work or other ornament not closely studied from nature. Although the term is taken from Arabian, that is, Eastern ornament, it is applied generally to work of European design. Varieties of Arabesque are seen in Figs. 194 and 195.

Arcade. — Two or more arches with their imposts, spandrels, etc., taken together. See Figs. 49, 97, 98, and 102.

Arch. — Properly a method of spanning an opening by means of heavy wedge-shaped solids which mutually keep one another in place. The shape is indifferent; thus, in Plate X., the uppermost figure is as much an arch as any of the others. In the practice of masonry it often happens that an arch is built with such strong and adhesive mortar that the whole becomes a solid bar or thick plate, and loses its true character as an arch.

Architrave. — In classical architecture, the lowermost division of an entablature, the epistyle. See Figs. 9, 10, and 15. Hence, because this lowermost division is supposed to be carried along the upright sides as well as the top of a square opening, any moulded or otherwise ornamented band carried around a door, window, or the like, on the wall face, or projecting from it. See Figs. 218 and 243.

Archivolt. — An architrave modified by being carried around a curved opening instead of a rectangular one. See Plate X., where A, A denotes the archivolts of three forms of arches.

Arris. — A sharp edge made by two surfaces meeting so as to form a solid angle.

Arsinoeion. — A building dedicated to or associated with a person named Arsinoe; especially the round building in Samothrace, associated with the princess, daughter of Ptolemy I. of Egypt. See Fig. 24.

Artemis. — The Greek goddess of chastity and hunting; also of the birth of children; confused with the goddess of the moon, and also with the goddess of the life after death. She is the sister of Apollo. The Latin writers find her characteristics in their Diana.

Athena or **Athene.** — Goddess of wisdom, refined arts and studies, and scientific warfare. The special patroness of Athens, as the Greek name of the city, Athenai, shows. The Latin writers find her characteristics in their Minerva.

Athena Nike. — See Nike and Apteros.

Athena Polias. — Athena considered as the protectress of the city.

Atlantes (pl.). — Figures of men used as supports or apparent supports. Cf. Caryatid.

Atrium. — In Roman building the principal room of an early and simple house. In more elaborate dwellings a small court, only partially roofed, the rain upon which fell through the opening in the middle.

Attic. — Something built above the wall-cornice; a low story with windows, or a mere blank wall, but not a pierced or

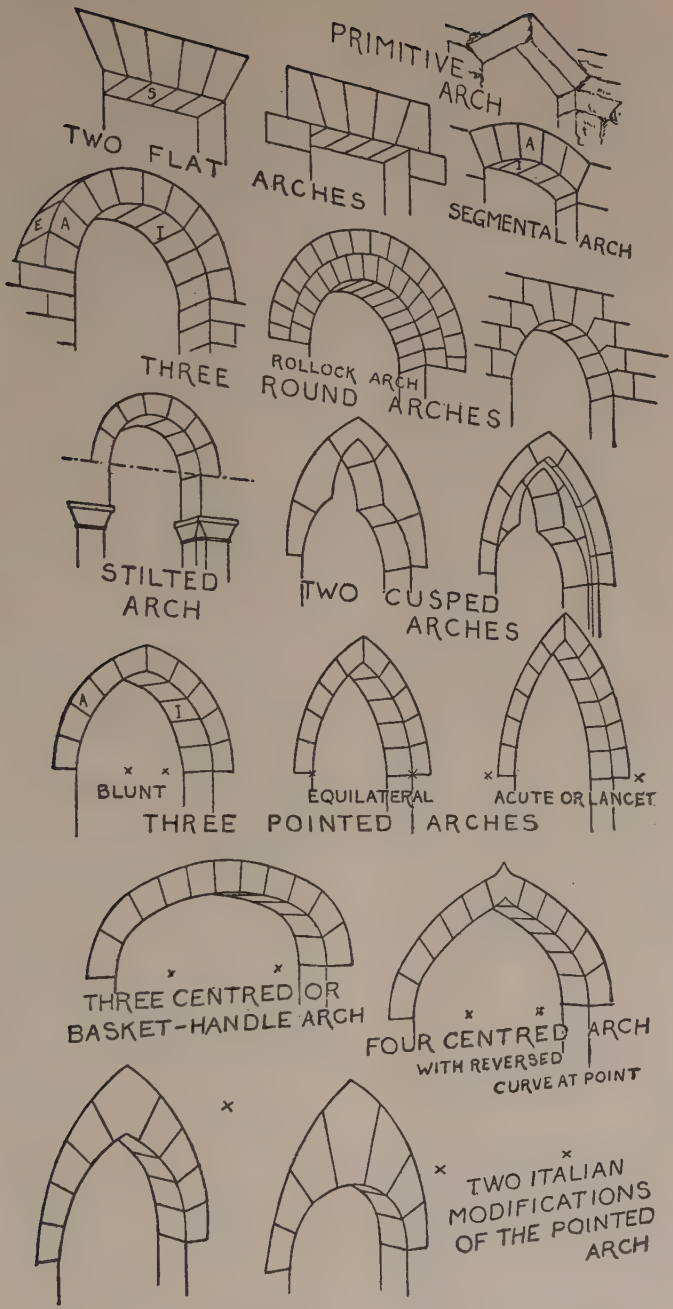


PLATE X. Illustrations of term "Arch" in Glossary.

open parapet. The design of a front is supposed to be complete without the attic, this being often added to form the front of rooms which could not be introduced otherwise. See Fig. 232.

Axis. — An imaginary line about which anything is supposed to be distributed, or a number of things arranged. Thus the axis of a bay is the middle line of it, all on one side of this line being supposed to be similar to that which is on the other side. Thus the nave and choir of a church are generally on the same axis, but Fig. 160 offers an exception.

Baldachino. — A canopy supported on pillars, as over an altar. See Fig. 60.

Barocque. — In decoration, irregular; unrestrained; in bad taste because excessive.

Barocco. — This is the Italian form of Barocque, which see.

Barrel Vault. — See Vault.

Base. — (*a*) The lowermost part of a column. See Figs. 15 and 18. (*b*) The lowermost part of a wall when treated in an architectural manner so as to differ from the rest of the wall and when smaller than the basement. Thus, in Figs. 218 and 230, the lowermost course of stone in the wall may be considered as the base. Cf. Basement.

Basement. — The lowest large architectural member of a wall, especially of the outer wall of a building. The basement differs from the base in being a much larger part of the wall, perhaps even a whole story. Thus, in Figs. 218 and 230, the whole wall up to the beginning of the order of pilasters may be considered as the basement. Cf. Base.

Basilica. — Under the Roman Empire a public building used for many purposes. See Ch. II. In early Christian architecture a church of simple form derived from the above (see Chs. III. and IV.). See Figs. 34, 59, and 60.

Bas-relief. — See Relief.

Bastide. — In French building in the middle ages, a town erected by special order and according to a settled plan. Twenty-five of these are named by Viollet-le-Duc in his *Dictionnaire*, s.v. *Maison*.

Bay. — One of the larger similar divisions of a building. It is usually taken as extending from the axis of one of the main supports to the axis of the next. Thus Fig. 92 gives two full bays of the nave, comprising four of the aisles, and Figs. 91 and 94 give one bay of the nave, comprising two of the aisles. Figs. 141, 143, and 164 give one bay each.

Bell. — That part of the capital of a column which is within the leafage or other sculptured ornament. Thus, in Fig. 21, the bell is the smooth rounded part from which the ornament projects. In the Doric order the bell has no echinus and has no ornament. See Fig. 11.

Boss. — A small projecting member, usually intended for ornament alone, and serving as the termination of a string course, a hood moulding, or the like. In Figs. 128 and 164 A, bosses can be seen in the shape of human heads, while in Fig. 164 they are in the shape of the upper part of the human figure.

Brace. — In carpenter-work a piece of wood set diagonally to stiffen a frame. See Figs. 185 and 219.

Bracket. — Any projecting member meant to carry a weight. The term is used very loosely.

Bull's-eye. — A circular or oval window of small size, usually forming a decorative part of an architectural composition. See Figs. 245, 246, 247, and 248.

Buttress. — A piece of walling used to resist the thrust of arches or vaults. The use of the buttress became so marked a feature in the exterior of Gothic building that buttresses are constantly built where no need for them exists. See plans and

views of churches in Chs. V., VI., and VII. See especially Figs. 115, 122 and 145.

Buttress-pier. — That part of a buttress which is carried up above the wall, of which it forms part below. Rising in this way clear of the roof, it receives a flying buttress, or serves to weight and steady the buttress below. See Plate III. and Figs. 116 and 117.

Caldarium. — In a Roman building, the hot chamber of a bathing establishment.

Campanile. — In Italian architecture of any period, since the fall of the Roman Empire, a bell-tower. See Fig. 142.

Candelabrum (pl. **-bra**). Originally a lamp-stand; in Greek and Roman art, these were treated in a highly decorated way. By extension, a decorative composition, like the carving on the face of a pilaster; a design in which the main lines are vertical.

Canopy. — A member used to form a small roof or semblance of roof, as in a Gothic niche, which see. Also, a roof built or suspended over an altar, dais, or the like, as an honorary and ornamental feature. See Fig. 126, the arched canopies over the largest statues. See the top of the baldachino in Fig. 60.

Capital. — The uppermost of the three principal divisions of a column. It is divided into abacus, bell and necking.

Cartouche. — An ornamental tablet or panel, prepared to receive an inscription or the like. Heraldic escutcheons which are not of shield-shape, but oval or irregular, are called by this name. See Fig. 235, on each side of the portico with pediment. See also Fig. 255.

Caryatid (pl. **Caryatides**). — A draped female figure, used as a support, or apparent support, as replacing a column. Cf. Atlantes and Telamones. See Fig. 25.

Cella. — Same as Naos. Cella is the Latin word, and is properly applied to the Roman temples.

Centre. — (*a*) Same as centring. (*b*) A small or partial structure, sometimes a mere guiding curve, as of plank used in the construction of arches and vaults. See Centring.

Centring. — A structure, generally temporary, put up to receive masonry, such as a vault, and to support it until complete.

Channel. — A groove; especially one of those cut upon the shaft of a Greek or Doric column. They are generally elliptical, or at least not circular in section, and are separated from one another only by an arris.

Channelled. — Grooved with channels, as distinguished from *fluted*.

Chapter-house. — In English ecclesiastical architecture, a large room for the meeting of the chapter, forming an adjunct to a cathedral.

Chevet. — In French architectural language, the choir-end or chancel-end of a church; especially applied to the rounded eastern ends of large churches. In Fig. 144, it is the large semicircular east end of the church, from which the chapels project.

Choir. — Originally, the space reserved in a church for the clergy and others who conduct divine service. In Fig. 60 the outer and nearer part is called the choir; the part within, where the high altar and the baldachino are, is properly the sanctuary. By extension, that part of a large church in which the choir is situated; especially, in a cruciform church, the main division farthest from the principal entrance and beyond the transept. In Figs. 120 and 144, all east of the transept would be called the choir.

Choir-screen. — The wall, arcade or grating which separates the choir proper from the rest of the church. In Fig. 60, the wall is too low to be called a choir-screen; the jubé (which see) is that part of the choir-screen which faces the nave.

Choragic. — Having to do with a choragos, or director of an Athenian chorus, as in the festivals of Dionysos. *Choragic monument:* a structure put up to commemorate the service of a choragos. There were many such in Athens, and it was usual to set upon the top the bronze tripod awarded the choragos of the year. See Figs. 19 and 20.

Ciborium. — In Italian architecture, a canopy or roof on pillars, especially over an altar. See Baldachino.

Cimborio. — In Spanish architecture, a cupola or canopy; the Spanish form for ciborium.

Cinque-cento. — The sixteenth century considered as a time of development in Italian art. The word is used also as an adjective, as cinque-cento design.

Cité. — In French archæology, a separate and especially a fortified part of a town; usually the more ancient part of the town, that which contains the cathedral or principal church.

Clear-story. — A raised part of a building having windows in its sides above the lower roofs. It differs from a *lantern* in being long, with parallel sides as forming a considerable part of the main structure. Thus in Figs. 73 and 95, the uppermost windows are those of the clear-story. See, also, Figs. 118 and 132.

Cloister. — (*a*) A covered ambulatory; usually carried along the sides of a square court. (*b*) By extension, the whole court, of which the open part is called the *Cloister-garth.*

Coffering. — Ornamentation of a ceiling, or of the soffit of an arch, by means of recessed panels. See Fig. 28.

Collar-beam. — A piece of timber used as a tie, crossing the truss of a roof, horizontally, at a higher level than the feet of the rafters. Cf. Tie-beam. See Fig. 166 A.

Colonnade. — A row of columns with the stylobate they rest upon, and the entablature they support.

Colonnette. — A very small column, as one of a cluster forming a pier, or part of a screen or tomb or piece of furniture. Thus in Fig. 130 there are two colonnettes.

Column. — An upright, supporting member, usually cylindrical for the greater part of its length. It is divided into the three parts: *capital*, *shaft* and *base*, which see.

Composite Order. — In architecture of the Roman Empire a variety of the Corinthian order. See Fig. 50.

Concordia. — A Roman goddess, a personification of friendly intercourse and mutual agreement, as between the patricians and plebeians. The name, when given to a Greek temple (as at Akragas, see Ch. I.), is of course erroneous.

Concrete. — An artificial stone made of small pieces of stone, brick, or the like, mixed with strong cement mortar in great comparative quantity. The mortar, indeed, forms the chief part of the mass, and holds the stones, etc., imbedded in it.

Console. — An ornamental detail like a corbel, and having a projection as if to carry a weight. It is used especially in the classical and neo-classical styles. The French use the term much more freely, and such expressions as console-table have been adopted in English.

Coping. — The covering of a masonry wall at top to protect it against the weather, as by a row of stones each wider than the wall.

Corbel. — A projecting member of stone or brick work, or the like, forming a solid part of a wall or pier, and arranged to carry a superincumbent weight. The corresponding French term, *corbeau*, is limited to a member whose sides are parallel, whereas *cul-de-lampe* is used for one semicircular or polygonal in plan. It would be

well if this distinction were maintained in English.

To corbel out. — To build, as with bricks, in course, each course projecting horizontally beyond the one which supports it.

Corinthian Order. — The richest of the three Grecian orders, adopted by the Romans as their favourite decorative system.

Cornice. — (*a*) In Greek and Roman art, the uppermost of the three members of an entablature, which see. (*b*) The coping of a wall when made to project considerably beyond the face of the wall, and made into a decorative feature. In sense (*b*) often called *wall-cornice*. See Fig. 164, the horizontal member below the pierced parapet, and the sculptured corbels which support it.

Cortile. — In Italian architecture the large, square or nearly square court of a civic or domestic building.

Course. — One horizontal row or layer, as of stones or bricks, in a wall or pier.

Cove. — A moulding of hollow or concave section.

Cradle Vault. — Same as Barrel Vault. See Vault.

Cramp. — A piece of metal used to hold together blocks of stone in a wall; commonly a sort of bar bent at each end like a hook.

Crowned up. — Rounded upward. (*a*) On the upper surface alone, as of a deck or a road. (*b*) Of the under surface only, as of a ceiling. (*c*) In the whole mass, as when a timber laid horizontally is selected or shaped so as to have a slight upward curve.

Cupola. — A vault of the general form of a cup. Hence, by extension, a rounded or bulging roof, whether high and of great projection or low and flat.

Cusp. — A pointed projection from the inner edge or surface of an arch, its edges being usually curved, and seeming to grow out of the main arch insensibly. The cusps are the ornamental features of Gothic tracery, as in Figs. 124 and 170.

Cusped. — Furnished with cusps, as an arch or arched opening.

Dado. — The lower part of the wall, generally of a room or a hall, when treated as a separate architectural member.

Decastyle (*Dekastyle*). — Having ten columns in front; as a portico or temple.

Demeter. — In Grecian mythology, the goddess of plants, especially of plants useful to man, as of grain and the like, and of the fertility of the earth. The later Roman writers applied the Greek stories of Demeter to the Italian goddess Ceres.

Dentil. — One of the small, square-edged, solid projections which, separated by vacant spaces of about their own width, form a common ornament in classical entablatures, string-courses, etc.

Dentil-course. — A row or series of dentils, as if a square-edged moulding had had pieces cut out of it, leaving small, separate, rectangular blocks.

Dionysos. — In Grecian mythology, a god worshipped in many capacities, but especially as the patron of wine and of the drama, which was peculiarly sacred to him. The later Greek poets called him Bacchos, which, in its Latinized form Bacchus, became the Latin name under which he was known.

Dipteral. — Having a double row of columns; especially said of a temple having two rows of columns outside the naos or cella.

Distyle. — Having two columns in front; said of a portico or temple. See Fig. 6, and the inner porticoes of Fig. 1. *Distyle in antis*, see Antis.

Dodecastyle (*Dodekastyle*). — Having twelve columns in front, as of a portico or temple.

Dome. — Same as Cupola.

Doric Order. — (*a*) The most impor-

tant order of Grecian architecture (see Ch. I. Sec. I.). (*b*) An order developed by the Romans partly from Greek, partly from Etruscan models; its resemblance to Grecian Doric is slight, and the name of questionable propriety.

Dormer-window. — A window built up from a sloping roof with sides and roof of its own; the name being applied to the whole structure, like a small house resting on the slope of the larger roof. See Figs. 184 and 207.

Drip-moulding. — A moulding or group of mouldings undercut in such a way as to cause rainwater to drip from it instead of running down the surface.

Drum. — (*a*) The cylindrical or polygonal wall carrying a cupola or dome. (*b*) One of several cylindrical blocks of stone which make up the shaft of a column.

East End. — See Orientation.

Echinus. — (*a*) The bell of the Grecian Doric capital, so called from its sectional curve, which is supposed to resemble that of the sea-urchin. (*b*) In Roman Doric and in some forms of Roman Ionic the moulding forming the principal part of the bell of the capital, commonly sculptured with a simple ornament.

Echinus Ornament. — Same as Egg-and-dart Ornament. So called because used to decorate the echinus of the Roman Doric order.

Egg-and-dart Ornament. In Greek art and the styles based upon it, a simple ornament consisting of small egg-like bosses, each surrounded by a groove and ridge, and alternating with a sharp-pointed feature, like an arrow-head, intended to give contrast.

Elevation. — In architectural drawing the vertical projection according to descriptive geometry of a building or any part of it; especially of the exterior as distinguished from the section.

Elizabethan Style. — The style prevailing in England from about 1550 to 1610, and, therefore, nearly contemporary with the later French Renaissance. See Ch. VIII. Sec. IV.

Engaged Column. — (*a*) A column of which only a part, three quarters or less, is left free from a wall or pier against which it is set. See Fig. 42. (*b*) An architectural feature resembling a column, but built with the wall in courses of stone or brick; compare Roman order, and see Fig. 44.

Entablature. — In Grecian and Roman art and in the later classic styles, the whole mass of building which rests, like a low wall, upon the columns or pilasters, and forms the uppermost part of the order. It is always assumed to be made up of three parts, architrave or epistyle, frieze and cornice. In a very few ancient buildings there are fewer than three parts: thus in the Caryatid portico, Fig. 25, there is no frieze.

Entasis. — The slight convex curve of the upright lines of a shaft, as in classical architecture. It is most noticeable in the Grecian Doric style, its purpose being to prevent the natural tendency of a true conical form to seem a little hollow. See Fig. 9.

Epinaos. — Same as Opisthodomos in its first sense; and same as Posticum. Where opisthodomos is used for an enclosed chamber, epinaos would be the correct term for the porch beyond it.

Epistyle. — Same as Architrave.

Erechtheus. — An early hero of Attic legend, to whom, as to Theseus, divine honours were paid in Athens.

Eye. — See Oculus.

Façade. — The front of any building which is so designed as to have a front especially distinguished from its other parts. Thus a Greek temple or a thirteenth-century church has no façade, but

a modern house fronting on a street has generally a façade and no other architecturally treated parts.

Fan Vault. — See Vault.

Fillet. — A narrow flat moulding.

Finial. — The ornamental boss or floral ornament which forms the top of a spire, gable or pinnacle, or which crowns a window where, as in the later Gothic, the arch ends in a reversed curve. See Figs. 124 and 158.

Flamboyant. — Having window-tracery disposed in patterns not strictly geometrical, but in elongated and pointed curves supposed to resemble flames. The term is applied by English writers to the French Gothic of the fifteenth century, but is rarely used in French. See Figs. 174 and 180.

Flute. — One of the grooves in an Ionic or Corinthian column; or generally of any column except the Grecian Doric. Flutes are generally circular in section, and are separated from one another by narrow fillets. Cf. Channel.

Fluted. — Grooved with flutes, as distinguished from channels.

Flying Buttress. — An arrangement for transmitting the thrust of a vault across a space to a buttress or buttress-pier beyond. See Ch. V. Sec. I., and Figs. 116 and 117.

Foliated. — Parted into leaves or leaf-like divisions; said of ornament.

Forum. — The Latin term for an open place in a town, the place of popular assembly, and often the chief market-place.

Frieze. — The second, or middle part, of an entablature; hence, by extension, any horizontal band serving an ornamental purpose, especially if rich, as a band of sculpture in relief.

Fronton. — A modification of the pediment used above a door or window, and either gable-shaped or rounded or irregular, and broken in outline. See Figs. 207, 213, 218, 230 and 240.

Gable. — In a building with a double-pitched roof, a piece of wall which closes the end of the roof, and is therefore generally triangular. By extension a triangular piece of wall or ornamental semblance of wall, which rises above a doorway or window. The pediment of a Greek temple is a low or blunt gable, resulting from a low double-pitched roof.

Galilee. — In English building, an adjunct or extension to a church; sometimes a chapel, more often an outer room or porch. Only six, or possibly seven, rooms now existing are known by that name.

Gargoyle. — In mediæval architecture, a spout for throwing off rainwater from the roofs, etc.; generally of stone, and often carved into some grotesque animal or human form. See Figs. 175 and 176.

Gorgerin. — The necking, as of a column or pilaster; especially, where there are two parallel mouldings or groups of mouldings separating the bell of the capital from the shaft, the space between these.

Groin. — The angle between two curved surfaces of a vault. See Vault.

Guilloche. — A running ornament formed of two or more ribbons or straps which interlace, forming circular openings.

Gutta (pl. **Guttæ**). — One of the series of small pendant cylinders or truncated cones, used in the entablature of the Grecian Doric order. See Fig. 9.

Hagia. — The Greek term, signifying holy or saint. As the great church at Constantinople is not dedicated to any sainted personage, but to the Divine Wisdom, Hagia Sophia, it is a convenience to call the church by that name, or abbreviated as H. Sophia.

Haunch. — That part of an arch which lies between the crown and the impost; one of the two sides or flanks. The

haunch cannot be exactly limited; it includes the greater part of each half of the arch. Also the corresponding part of a vault.

Hephaistos. — In Grecian mythology, the god of fire and metal-working, identified by the late Roman writers with the Italian deity Vulcan. By an extension of the idea, Hephaistos becomes the creator of fine art and the master-builder and the patron of artisans and artists.

Herakles. — In Grecian mythology, a demi-god, son of Zeus, the personification of physical strength and the righter of wrongs. The Romans Latinized his name as Hercules.

Hercules. — See Herakles.

Hexastyle. — Having six columns in front, as a portico or temple.

Hip. — In a roof of approximately pyramidal shape, one of the projecting or solid angles. See Hipped Roof.

Hip-knob. — An ornamental projecting member at the apex of a hip-roof. By extension, and especially in English architecture, a similar ornament in other situations, a finial adapted to wooden buildings.

Hipped Roof. — A roof which slopes from at least three sides toward a point or ridge at the top, and which is therefore somewhat pyramidal in shape. The solid angles or ridges which reach from the eaves to the top are called hips, and the piece of timber which forms each one of these is a hip-rafter.

Honeysuckle Ornament.—The most common anthemion used in Grecian art.

Hood Moulding. — A moulding or group of mouldings carried above and around the head of a window opening or door opening. See Fig. 128 in the upper story.

Impost. — That part of a structure which supports one side of an arch; therefore commonly the top of the wall beneath the arch, or of a pillar or pier in a similar situation.

Intercolumniation. — The space from one column to another in any portico or colonnade. This may be measured from axis to axis of the columns, or between the shafts near the bottom, the former being much the more usual method of reckoning.

Intrados. — The inner and lower face of an arch. See I, I, in Plate X.

Ionic Order. — The second of the three orders used by the Greeks. See Ch. II. Sec. II.

Jamb. — In a doorway or window opening the surface formed by the thickness of the wall. The term refers to the surface only, and has no relation to a separate member or piece of material.

Joint. — The space between the adjacent surfaces of two stones, bricks, or the like. When filled with mortar it is called mortar-joint.

Jubé. — The screen which separates the choir from the rest of the church on the side towards the nave. Cf. Rood-screen.

Kekrops (*Cecrops*). — The mythical first prince of Attica, and founder of Attic civilization.

Keystone. — That one of the voussoirs of an arch which is put in last and is often driven in with blows of a mallet. Cf. Fig. 114 and note describing it.

King-post. — In roof-framing, a piece of timber which is used to suspend the middle of the tie-beam from the head of the rafters. It is properly not a post, but a tie.

Krepidoma. — In Grecian architecture the whole platform of masonry which forms the floor, the stereobate, etc., of a building, especially a temple.

Lady Chapel. — In English ecclesiastical architecture, a chapel dedicated to the Virgin, especially when large and partly detached from a large church.

Lantern. — Any round or polygonal upright member having many windows in its vertical wall or walls; especially (*a*) the culminating part of a cupola. See Figs. 232, 236 and 252. (*b*) In mediæval art, the uppermost story of a tower when lower and less pointed than a spire, as in the church of Boston, Lincolnshire, or the church of S. Ouen in Rouen (see Plate III.).

Legatus. — In Roman antiquity an officer replacing or representing a higher officer, especially the governor of a province appointed by the emperor and governing in his name.

Lintel. — A piece of material laid horizontally from one upright support to another, and bearing a weight by its power of resisting cross fracture and bending strain.

Loggia. — A covered and partly enclosed place for walking and sitting in the open air, especially if enriched and architectural in character. See Fig. 169.

Louvre. — A lantern, in the architectural sense, especially a small one with openings to allow of the passage of air and smoke.

Lunette. — In vaulting, or the imitation of vaulting so common in modern times, that part of a wall which fills the rounded space beneath a vault.

Machicolated. — Having the defences usual in the middle ages, consisting of a projecting gallery supported on corbels; said of a wall or of a building.

Mars. — An Italian deity identified by the later Latin writers with the Greek Ares, and in this sense the god of war.

Meta (pl. **Metæ**). — In Roman antiquity anything set up to mark a limit or boundary; in the circus a column, or group of columns, around which the chariots turned at either end. Cf. Spina.

Metope. — In the Doric style: (*a*) The space between the triglyphs. See Entablature. (*b*) The block or slab often used to fill this space, sometimes very richly sculptured. See Figs. 9 and 10.

Minerva. — A Latin goddess, the daughter of Jupiter, and identified by the Latin writers with Athena; Minerva Medica, the goddess considered as patron of health and healing.

Modillion. — One of the ornamented brackets which seem to support the cornice in the Corinthian entablature.

Mortise. — A small hole, square or nearly square, cut in a piece of timber to receive a tenon.

Mortise and Tenon Joint. — A manner of putting together timbers by fitting a projection called a tenon on the end of one timber, into a hole called the mortise in the side of another timber.

Mosaic. — Decorative work done by means of small pieces of hard and durable material fitted together to cover a surface, as of a floor, wall or ceiling.

Moulded. — Decorated by mouldings; having its angle or surface varied by being worked into mouldings.

Mudejar Style. — In Spanish architecture, a modification of the late and florid Gothic by the introduction of Moorish details.

Mullion. — An upright member serving to divide an opening, or forming part of a framework. Cf. Transom. The mullions in Gothic windows are the origin of the bar tracery which forms so important a part in Northern Gothic decoration.

Mutule. — A surface in slight relief on the under side of the cornice in the Grecian Doric order. See Fig. 9.

Naos. — The inner chamber or principal enclosed part of a Greek temple. Compare Opisthodomos, and see the plans of temples, such as Figs. 1, 4 and 6.

Narthex. — The enclosed porch or vestibule of a church, used especially in connection with Byzantine and Eastern buildings. See Figs. 59, 68 and 101.

Nave. — The principal room in a public building; the large and high part of the place of assembly used in two senses in Christian church building. (*a*) The part nearest the principal entrance, and forming the chief resort of the laity, as distinguished from the choir and transepts. (*b*) The high middle part as distinguished from the lower aisles; in this sense the nave includes the clear-story, or the clear-story may be considered the upper part of the nave. As there is no term in use for the middle and highest part of the choir or transept, as distinguished from the aisles of those parts, the word "nave" is sometimes applied here, as, the nave of the choir.

Necking. — The lowest part of a capital of a column or pilaster; usually a moulding, or group of mouldings, around the capital, and separating it from the shaft. See Figs. 11 and 12.

Neo-classic. — An imitation of that which is classic; said of the architecture and decoration in use since the beginning of the architectural Renaissance about 1420.

Niche. — A recess or small chamber open on one side; by extension, as niches are commonly used to receive statues, a combination of a projecting bracket or corbel which may support a statue, and a canopy above which may shelter it; an important feature in Gothic architecture. See Figs. 128 and 129.

Nike. — In Grecian mythology the goddess of victory, or Victory personified. See Athena Nike.

Nike Apteros. — See Apteros.

North Flank, North Transept, etc. — See Orientation.

Nymphæum. — In Roman buildings, a temple, shrine or sacred enclosure dedicated to any nymph, or group or class of nymphs.

Obelisk. — (*a*) An upright shaft, square, with slightly sloping sides, and with the top cut to a pyramid, with the sides much more sloping; a decorative object in use among the ancient Egyptians. (*b*) By extension, a somewhat similar form occasionally introduced in neo-classic architecture. See Fig. 250.

Octostyle. — Having eight columns in front; said of a portico or temple.

Oculus. — A window of circular or oval form. See Bull's-eye.

Odeion. — In Greek building, a theatre arranged for musical entertainments, called by the Romans Odeum.

Ogee. — Curved like the letter S.

Ogee = moulding: a moulding which has a section or profile shaped like this curve.

Opisthodomos. — (*a*) The porch or vestibule behind the naos of a Greek temple. (*b*) In a very few temples, an enclosed chamber behind the naos; in these cases, the porch or vestibule beyond and behind the opisthodomos is called the epinaos, or, not so properly, the posticum.

Orchestra. — In the Greek theatre, that part of the space devoted to the performers which was occupied by the chorus.

Order. — In classic and neo-classic building. (*a*) The unit of decorative post-and-lintel composition; that is, a column or pilaster, with its pedestal, if any, and so much of the entablature as may be thought to go with the column or pilaster. (*b*) One of the different styles of Greek or of Roman architecture, as distinguished by the peculiarities of its order in the sense (*a*). Thus the Ionic order is the style known by its order being Ionic in character.

Colossal Order: An order extending the whole height, or nearly the whole height, of a building, and corresponding to two or more stories within.

Oriel. — A small loggia, especially if projecting from the wall of a larger building; also a similar projecting apartment, when enclosed with glass, in which case it is called an oriel-window. The distinction is sometimes made between a bay window

which rises from the ground, and an oriel-window which is corbelled out from the wall. See Fig. 224.

Orientation. — The system or habit of turning the entrance, or the peculiarly sacred part of a sacred building, toward one point of the compass. Greek temples often have their principal entrance at the east end; Christian churches have often their principal altar and the part reserved for the clergy and for divine service, at the eastern end of the building. This brings with it the arrangement common in Byzantine churches, and almost universal in Europe north of the Alps, of having the principal entrances and the especially rich front turned westward, the two long sides and the two arms of the transept turned northward and southward, and the apse, choir, chancel or chevet, where no entrance is commonly provided, turned eastward. Hence it is customary to speak of the front with the great doors as the west front and the corresponding sides, etc., as south flank, etc., without considering whether the terms are accurate in the given case. This arrangement is almost unknown in Italy.

Pallas. — Same as Athena.

Panel. — Originally a piece of board held in place by grooves in a frame which encloses it, or in some similar way, so that it is free to shrink and expand without splitting. By extension, a sunken or recessed surface, generally having a decorative purpose.

Parapet. — A low wall, balustrade, or railing, intended to keep people from falling, as from a roof or terrace.

Pausanias. — A Greek writer of the second century A.D., author of the "Hellados Periegesis, or Greek Itinerary." This book is the only considerable account preserved to us of the Grecian buildings and works of art as they were in antiquity, and contains nearly all the ancient documentary evidence that we have concerning them; but many very important details are left unmentioned.

Pedestal. — A supporting member, (*a*) set under a column to raise it above the stylobate or base line of the building (see Figs. 31, 221, 224 and 229), or (*b*) for an architectural vase or a statue. See Figs. 216, 233, 235 and 236.

Pediment. — In classic or neo-classic building. (*a*) The low gable wall at the end of a temple or similar oblong structure, and rising above the portico. Cf. Gable. (*b*) The crowning member of an ornamental framework around a window or similar opening, when approximating to the shape of a gable. Cf. Fronton.

Pendentive. — A curved triangular piece of vaulting, one of those which bring the square or polygonal chamber below to the circular form of the dome above. Thus in Fig. 69, the large triangles filled with cherubs are the pendentives.

Peribolos. — The enclosed space about an important building, as a temple; hence, a sacred enclosure.

Peripteral. — Having columns on every side; said of a Grecian temple.

Peristomion. — In Grecian archæology, a well-head or well-curb.

Peristylar. — (*a*) Having a peristyle; (*b*) forming a peristyle.

Peristyle. — A series of ranges of columns taken together, whether outside of the naos of a temple, or on the inside faces of a building upon a court, but always continuous.

Perpendicular Style. — The style of English Gothic prevailing about 1360–1480. See Ch. VI. Sec. IV., and Ch. VII. Sec. IV.

Perron. — A flight of steps generally few in number and out of doors, as leading to an external doorway, or to a terrace in a garden.

Pier. — A solid upright mass of masonry as between two windows or similar openings, or one of those between the nave and aisles of a church, when not a single column.

Pilaster. — A vertical member supporting or seeming to support an entablature or arch. A pilaster is always in slight projection from a wall or pier, and has only one principal face, thus differing from the anta, which has two or three faces.

Pillar. — A pier or column; the general term for all isolated upright architectural supports.

Pinnacle. — An upright architectural member, having generally a decorative purpose. In Gothic architecture, pinnacles are set upon the tops of buttresses and buttress-piers to supply additional weight where it is needed, as well as for ornament. See Figs. 125, 132, 158 and 159.

Podium. — (*a*) A continuous solid base of a wall, or support for a colonnade. (*b*) A low wall serving as a facing or retaining wall.

Polias. — See Athena.

Polychromy. — Decoration by means of several colours combined in a design.

Pompadour Style. — Same as Rococo.

Portico. — A covered porch or open building of any size with columns. Often, by extension, the row of columns itself, the pteron.

Porticus. — In Roman antiquity a porch or gallery. The word conveys the idea of an open colonnade less absolutely than the modern portico. Cf. Loggia and Ambulatory.

Poseidon. — In Grecian mythology, the god of the seas and one of the great gods of Olympus; brother of Zeus. The later Roman writers identified him with the Italian deity Neptune.

Posticum. — Same as Opisthodomos in its first sense. Often used for the porch outside of the opisthodomos, where epinaos would be more strictly correct.

Pronaos. — In Greek temples, the porch or vestibule at the entrance of the naos.

Propylaia. — A group of buildings forming or surrounding a gateway.

Prostyle. — Having columns in front only; said of a temple.

Pseudodipteral. — Having the row of columns as far from the wall of the naos or sekos as if there were a second and inner row. Said of any peristylar structure.

Pteroma. — The space between the pteron and the wall of the enclosure; also all the space from the wall of the enclosure to the top step or edge of the stylobate.

Pteron. — A range or row of columns; a colonnade so far as the columns themselves and their superstructure are concerned, but not including the covered space between and behind them. Cf. Pteroma.

Puteal. — A well-head or well-curb. Cf. Peristomion.

Quoin. — One or many stones or similar masses of material which form a corner. The term is used for masses that are accurately cut and set, and form a feature in the design.

Reeded. — Decorated by means of convex ridges set close together; the reverse of fluted or channelled; said especially of a shaft of a column in classic or neo-classic architecture.

Relief. — In sculpture, projection of the figures or foliage from a background which is not necessarily continuous nor uniform.

Bas-relief: Low relief, although the lowest relief of all, as in coins and medallions, receives a different name. With the article, frequently used for a relief of any kind.

Ressaut. — A projecting member formed by carrying the entablature of a colonnade out at right angles as if to form a pier or buttress, and putting a column or pair of columns beneath it. See Figs. 45, 198 and 229.

Rocaille. — Decoration by what is as-

sumed to be rock-work or a grotesque combination of water-worn stones, shells, and the like; by extension, decorations by scrolls and curved ribs not continuous but in broken parts, which intercept one another, especially in the borders of panels and openings, and accompanied by naturalistic plant and animal forms. See Rococo.

Rococo Style. — The style which prevailed from about 1700 until the appearance of the Louis XVI. style, about 1770. It is marked by abundance of rocaille decoration.

Roll Moulding. — A convex moulding of large size, sometimes having the surface carved into the semblance of laurel leaves or the like.

Rood-screen. — In English architecture the same as 'jubé,' so called because often carrying a cross or crucifix called Rood.

Rose-window. — A large circular window filled with tracery of generally radiating character.

Roundel. — A circular window or panel, or other such architectural member.

Rubble. — Stones of irregular form and size, and masonry made of such stones.

Sacristy. — A room or set of rooms attached to a church, and used by the clergy and choristers for robing and for the storage of church utensils, etc.

Scale Ornament. — An ornament made by flat plates overlapping one another, or by the appearance of them as in imbrication.

Scroll. — In architectural ornament, any spiral or waving stem which gives off smaller stems at intervals, or which forms spirals or volutes. Scrolls are sometimes worked with leaves and flowers, as in Roman and neo-classic ornament.

Segmental Arch. See figure in Plate X.

Sekos. In Grecian building, the inner part of a colonnaded structure. As the words naos and cella have been used so generally for the oblong enclosed parts of ordinary temples, the word sekos has been applied to such a room when circular or of other unusual form.

Sexpartite. Divided into six parts; said of certain kinds of mediæval vaulting. See Fig. 111.

Shaft. — The middle or larger part of a column. In general, any slender upright member.

Skewback. — A sloping surface against which a segmental or flat arch may abut. The term is extended to the mass of material which forms the sloping surface, as a stone, or an iron plate with its proper supports.

Soffit. — The under side of a lintel or other horizontal member, indicating the surface only, and not the piece of material. Cf. Jamb.

South Flank, South Transept, etc. — See Orientation.

Spandrel. — (*a*) The triangular space between the curved sides of two adjacent arches and any horizontal moulding or band above. (*b*) A triangular space between the curved side of one arch and any vertical member, as a pilaster or frame.

Spina. — In Roman antiquity, a low thick wall dividing the arena of a circus in the direction of its length, but not exactly parallel with either side.

Springing Line. — In the mathematical drawing (elevation or section) of any arch, except a flat one, the horizontal line, which passes through the centre or centres and which meets the vertical lines of the impost at the level where they are tangent to the curves of the arch. Hence, by extension, an imaginary line which marks the beginning of the actual curve, as of the intrados. See Figs. 87 and 88.

Stereobate. — The mass of masonry upon which the outer walls or colonnades of a building rest; the visible and archi-

tectural part of the foundation; it includes the stylobate, which is its upper layer, and forms the outer vertical or nearly vertical face of the krepidoma.

Stilted Arch. — An arch whose springing line is raised decidedly above the apparent impost, as the capital of a column or the like. See Arch, and Fig. 88.

Stoa. — In Greek building, a porch or open gallery; very nearly the same as the Roman porticus.

Strap Ornament. — Ornamentation made by plaited or interlaced bands; by extension, a representation in carving or painting of such interwoven ornament. See Fig. 226. Also by extension, and less properly, ornament made up of strap-like or ribbon-like members, not necessarily interlaced. See Figs. 225 and 226.

Strigil Ornament. — Decoration by means of flutes or channels cut parallel, but in slightly marked S curves. The name is taken from the strigil, the classical implement for scraping the skin, as at the bath.

String Course. — A horizontal or generally horizontal band, usually of ornamental character.

Strut. — In timber framing a piece of wood used as a brace or stay, like a post, but often not in a vertical position. See Fig. 166 A.

Stucco. — Plaster used to cover surfaces, especially that which is weatherproof and fit to use out of doors.

Stylobate. — The substructure for the columns, especially in a Greek building, the outermost part of the krepidoma upon which the columns stand. See Fig. 9.

Tambour. — Same as Drum.

Telamones (pl.). — Same as Atlantes.

Telesterion. — In Greek archæology a place for initiation.

Temple. — A place especially set apart for the worship of a divinity; usually a building.

Tenon. — See Mortise and Tenon Joint.

Tepidarium. — In Roman building, the warm chamber of a bathing establishment, offering air and water cooler than the caldarium, but not cold.

Tetrastyle. — Having four columns in front; said of a portico or temple. See the north portico of the Erechtheion, Fig. 14. See also Fig. 35.

Thermæ (pl.). — In Roman antiquity, public baths, a plural noun not used in the singular.

Theseus. — In Grecian mythology, a hero, founder of Athens and the Attic state. Divine honours were paid him in Athens.

Tholos. — In Grecian building, a circular edifice of any sort. See Fig. 24.

Thrust. — The horizontal or diagonal pressure exercised by a vault or arch.

Tie-beam. — A piece of timber secured horizontally across a roof-truss at the feet of the rafters to keep them in place and prevent the truss from spreading. In Fig. 166 A there is no tie-beam properly so called; but A, the collar-beam, is the tie-beam for all the truss above it. See also Fig. 152, where one end of a large tie-beam is shown.

Tie-rod. — An iron rod used as a tie, as to replace a tie-beam (which see), or to take up the thrust of an arch. See Figs. 168 A, 169 and 171.

Torus. — A large moulding of convex, nearly semicircular, section. Cf. Roll Moulding. See, in Fig. 15, the lowermost moulding of the base.

Trabeated. — Made up of beams; having beams for an important part.

Trabeated Construction: a system of building in which upright posts carry horizontal beams. All Greek buildings described in Chap. I. are of this character. See also Figs. 35, 36, 39, 233 and 256.

Tracery. — In Gothic architecture the decorative arrangement of openings and

solids in the head of a pointed window, in a pierced gable, or in mere decorative relief on a panel.

Bar Tracery: that in which the patterns seem to be composed of the bars which form the upright mullions below, and which are tangent to one another, or pass into one another gradually. See Figs. 124, 125, 136 (the more distant window), and 145–150.

Plate Tracery: that in which the openings are shown as cut through a flat surface which is adorned at the edges, with no attempt at imitating the interlacing of bars. See Figs. 141 and 168 A; but these examples are inadequate.

Transept. — That part of a building whose greatest length is at right angles or nearly so with the main lines of the building, especially in Christian churches. The transept is properly the whole mass which in the early basilicas is next to the apse and has the nave and aisles open into it, and which in the Gothic churches separates the longer mass of the church into two nearly equal parts. Some English churches have two such transepts. So much of a transept as projects to one side beyond the nave or choir should be called an arm of the transept, but it is common to speak of the south transept instead of the south arm of the transept, etc. Cf. Orientation. See Fig. 153, in which the lower structures of the aisles are carried as far to the north and south as the transept projects, which, however, would be perfectly recognizable from the outside. See also Fig. 120, in which the transept has rounded ends. See also Figs. 144 and 155; also for external effect, Fig. 127 and Plate III.

Transom. — A horizontal member serving to divide an opening or forming part of a framework. Cf. Mullion.

Tri-apsal or **Triapsidal.** — Having three apses. Two forms of tri-apsal churches are common: one in which an apse forms the end of each aisle as well as of the nave, the other in which the apses project in three different directions, as in Fig. 71. In Fig. 72 the three apsidioles do not make this a tri-apsal church, because they are only chapels and relatively low. Cf. Figs. 76 and 144.

Triforium. — In mediæval church architecture, an open arcade or similar architectural feature in the wall of the nave, choir or transept above the great arches which open into the aisles. By extension, the triforium gallery. In Fig. 121, the arcade of small arches, four to the bay, is the triforium. In Figs. 135 and 164, the arcade immediately above the nave arches.

Triforium Gallery. — A gallery between the vaulting of the aisle and the sloping wooden roof above, opening into the nave or other high part of the church through the arcades of the triforium. The triforium gallery is often called triforium.

Triglyph. — In the Grecian Doric order, one of the solid blocks resting upon the epistyle and supporting the cornice. The triglyphs, and the metope slabs between them, form the frieze of the order. See Figs. 9 and 10.

Trumeau. — The mullion or slender pier supporting the tympanum of a Gothic portal and dividing the opening into two doorways. See Figs. 126 and 180.

Truss. — A framework of timber, especially one of the triangular frames which support the roof. Fig. 166 A shows one-half of an extremely complicated truss. Fig. 156 shows trusses of very simple character.

Tudor Style. — In English architecture the style which is identified with the reigns of Henry VII., Henry VIII., Edward VI., and Mary.

Tympanum. — (*a*) A recessed panel-like space between constructional members, as the triangular panel of the pediment

beneath the raking cornice and above the lower cornice. See Figs. 2, 5, 35 and 36. (*b*) the space beneath the arches of a portal, and above the actual doorway or doorways. See Figs. 126 and 130. In Fig. 180 there are subordinate tympanums, and a large one above.

Vault. — A structure of masonry so built as to form a roof or ceiling.

Annular Vault: (*a*) A vault built over a passage, aisle or gallery having a curved plan; especially a barrel vault in such a position. See Fig. 62. (*b*) A vault the surface of which is ring-shaped, but not horizontal. Thus, if a half-tube is bent in the form of an arch, rising above a horizontal plane, the inner surface of such a tube resembles some vaults used in Romanesque work (see Ch. IV.); and such vaults are called annular although their surfaces may not be everywhere parts of the same tubular or ring-like surface. See Fig. 88, where X is approximately an annular vault.

Barrel Vault: A vault which has the same cross-section everywhere. Thus, in Fig. 192, the vault on each side of the cupola.

Fan Vault: See Figs. 190 and 191, and Plate VIII., and the text describing them.

Groined Vault: A vault which is made up of cylindrical vaults meeting and intersecting one another, and built in a solid shell without independent and supporting ribs. See Figs. 29 and 67.

Ribbed Vault: A vault built with ribs which carry and support the vaulted surfaces, as in Gothic architecture.

Wagon Vault: Same as Barrel Vault.

Vaulted. — (*a*) Made of vaulting, as a roof. (*b*) Covered or roofed by a vault, as a room or hall.

Venus. — In the earlier Roman mythology, a goddess of minor importance; afterwards identified with Aphrodite, which see.

Vera di Pozzo. — In Venice, a cistern-head; one of the solid blocks of stone or marble, pierced with a round shaft vertically through the middle, and serving to protect the mouth of one of the cisterns in which is stored the water brought from the mainland. Two in the court of the Ducal Palace are of bronze. Cf. Puteal and Peristomion.

Vesta. — In Roman mythology, the goddess of fire and of the domestic hearth.

Vitruvius. — A Roman architect and writer on architecture. His name was Vitruvius Pollio, and he lived in the reign of Augustus. His work, "Ten Books on Architecture," is the only one on building, treated technically, which has come down to us from classical times; but it is brief, and most unsatisfactory as a treatise or as a history.

Volutes. — An ornament in the shape of a spiral, especially one of the flat spirals at the corners of an Ionic capital. See Figs. 13, 15 and 53.

Voussoir. — One of the solid bodies, more or less wedge-shaped, of which an arch is composed. See Plate X.

Wainscot. — Woodwork used in partitions, lining of rooms and the like.

Wall-arch. — In Gothic vaulting, the rib which is built at the extreme outer edge of the vault, where the wall or the window is, to close the vault on the outside; also the corresponding rib on each outer edge of the square or trapezium formed by the vault. See diagrams of Gothic vaulting, Ch. V.

West Front, West End, etc. — See Orientation.

Zeus. — The chief of the Greek gods, the special deity of the sky, and of lightning and thunder. Olympia and Dodona were peculiarly sacred to him. The Latin writers found his character and attributes in their own Deus Pater, or Jupiter.

INDEX

A.

Aachan, see Aix-la-Chapelle.
Abbeville: Ch. of S. Wulfram, 334, 335, 351.
  Hôtel de Ville, 417.
Adam, James, 535.
Adam, Robert, 535.
Ægina, Island of: Ruins, 7, 36, 41.
Aerschot: Jubé in Church, 417.
Aix-la-Chapelle: Imperial Chapel, now Cath., 147 (fig.), 280.
Aizani: Temple of Zeus, 24.
Akragas: Ruins, 6, 7.
  Temple of Concordia, 65.
  Temples at, 531.
  Temple of Zeus, 42, 43 (fig.), 44, 94.
  Tomb of Theron (so-called), 47.
Alberti, Leon Battista, 371, 372.
Albi: Cath. (S. Cécile), 264, 276, 282, 342 (fig.).
Alcantara: Roman Arch, 89.
Alexandria: Roman Monument (called Pompey's Pillar), 92.
Amboise: Chateau, Chapel of S. Hubert, 342; vaulting, 342.
American "Old Colonial" style, 534, 535.
Amesbury House, 517.
Amiens: Cath., 209, 232, 307 (fig.), 308.
Ammanati, Bartolomeo, 466, 472.
Amphitheatres, Roman, 63, 70.
Ancona: Arch of Trajan, 89.
Ancyra: Temple of Augustus, 79.
Androuet du Cerceau, Jacques, 393, 407.
Anet, Chateau of, 409.
Angoulême: Cath., 159, 178.
Anthemios, 139.
Antwerp: Cath., 283, 284, 285 (fig.), 348.
  Ch. of N. D. de la Chapelle, 285.
  Ch. of N. D. des Victoires, 285.
  Ch. of S. Charles Borromeo, 419 (fig.).
  Doorway, 497 (fig.).
  Hôtel de Ville, 418, 419.
  Tower of Cathedral compared with that of Strasburg, 348.
Aosta: Roman Gateway, 87.
  Triumphal Arch of Augustus, 89.
Aphrodisias: Temple of Aphrodite, 24.
Arabesques, 375 (figs.).
Arles: Amphitheatre, 70.
  Cloister of S. Trophime, 179.
Artistic Ability, Decay of, in fourth century A.D., 143.
Ashton Hall, see Birmingham.
Assisi: Ch. of S. Francis, 257 (fig.), 311.
  Roman Temple, 77.
Assos: Ruins, 7.
  Temple, 37.
Athens:
  Acropolis: buildings, 49; also see Erechtheion, Parthenon, Propylaia, Temple of Athena Nike.
  Arch of Hadrian, 86, 87 n. (fig.), 89, 97, 113.
  Cathedral, the Old, 136.
  Choragic Monument of Lysikrates, 30, 31 (fig.), 32 (fig.), 34.
  Churches (Byzantine), 183.
  Erechtheion, 2, 23 (fig.), 24, 25, 26 (fig.), 28 (fig.), 39, 85.
  Odeion, 70.

Athens: Parthenon, 2, 4, 9 (fig.), 37, 85, 532; description of, 9, 10, 20, 21; sculpture from, 41; compared with Temple of Zeus at Olympia, 10 (fig.).
Propylaia, 13 (fig.), 14 (fig.), 532.
Stoa, or Portico of Attalos, 25.
Temple of Athena Nike, or Nike Apteros, 14, 22, 37.
Temple of Athena Polias, see Erechtheion.
Temple of Olympian Zeus, 79.
Temple of Theseus (so-called), see Theseion.
Temple of the Winds (so-called), 32 ff.
Theseion, 5, 37, 38, 39 (fig.).
Audenarde: Hôtel de Ville (Town Hall), 417.
Autun: Roman Arch, 88, 97.
Avignon: Ch. of S. Pierre, 341.
Palace of the Popes, 276.
Avila: Casa Polentina, 420 (fig.).
Ch. of S. Thomas, 350.
Avioth: Chapel, 338 (figs.).
Azay-le-Rideau, Chateau of, 391, 394.

B.

Baalbek: Architectural details, 119.
Circular Temple, 79.
Temple of Jupiter, 77 (fig.), 78 (fig.).
Bamberg: Cath., 170, 226.
Bapara: Roman Arch, 89.
Baptisteries, early, 120.
Barbas, Geronimo, 500.
Barcelona: Cath., 278.
Ch. of S. Agata, 133.
Ch. of S. M. del Mar, 282.
Ch. of S. M. del Pi, 282.
Barozzi, Giacomo, see Vignola.
Basilicas, Christian, 120 ff.; see also under Rome.
Roman, their construction, 71, 83, 120; see also Rome, Basilica of Maxentius and Constantine, Basilica Ulpia; their uses, 83; those of Syria, 66.
Their simple and unarchitectural character, 130 ff.
Bassai: Ruined Temple, 7, 37.
Bastides, 221.
Bath: Abbey Ch., 301.
Beauvais: Cath., 209, 393.
Hôtel de Ville, 417.
Houses, 402.
Belem: Convent, 351.
Benevento: Arch of Trajan, 87 (fig.), 106.
Bergama: see Pergamon.
Bergamo: Colleoni Chapel, 376.
Berlin: Palace, the Royal, 507.
Palace of Charlottenburg, 509, 510, 514.
Bernini, G. L., 473, 476, 477, 544.
Besançon: Roman Arch, 89.
Beverley: Minster Ch., 298 (fig.).
Béziers: Cath., 265 n.
Biella: Chapel, 133 (fig.)
Bijapur, Central India: Great Dome at, 522.
Birmingham: Ashton Hall, 445.
Blenheim Castle, 533.
Blickling Hall, 445.
Blois: Chateau, 418; arcades of, 353; Salle des Etats in, 222; wing of Francis I., 397 (fig.); wing of Louis XII., 395, 410.
Hôtel d'Alluye, 395.
Bloxham: Ch., 297, 298.
Bologna: Ch. of S. Petronio, 307 (fig.), 308 (fig.), 310, 311, 312, 319.
Bordeaux: Cath. (S. André), 263.
Tour Pey-Berland, 332.
Borromini, School of, 492, 500.
Boston: Ch. of S. Botolph, tower, 358.
Bourg-en-Bresse: Ch. of Brou, 351, 393, 417.
Bourges: Cath., 209, 225, 257, 308, 319, 475.
House of Jacques Cœur, 342.
Bradford-on-Avon: "The Duke's House," 440, 441.
Bramante, Donato, 374, 384, 419, 453.
Bramhall, Manor House of, 446.
Bramshill, Manor Ho. of, 441 (fig.), 448.
Branchidai: Temple of Apollo, 24, 37.
Brandenburg: Cath. (SS. Peter and Paul), 231.
Ch. of S. Katharine, 355, 356.

Brescia: Ch. of the Miracoli, 376.
Brindisi: Roman Memorial Column, 92.
Bristol: Cath., 301.
Brosse, Salomon de, 414.
Brou, see Bourg-en-Bresse.
Bruand, Libéral, 484.
Bruchsal: Schloss, 512 (fig.).
Bruehl: Schloss, 512, 514.
Bruges: Ch. of S. Sauveur, 283.
Brunellesco, 367 ff., 372, 373.
Brussels: Cath., 283.
Ch. of S. Gudule, 226.
Hôtel de Ville, 348.
Houses seventeenth and eighteenth centuries, 498.
Brympton House, 450.
Builders in the Middle Ages, 225.
Bullant, Jean, 404, 406, 538.
Bulla Regia: Ruins, 89.
Buonarroti, Michelangelo, 466 ff.
Burgos: Cath., 225, 424.
Burleigh-House, 442.
Bussy: Chateau, 395, 399 (fig.).
Buttress-System, 198 ff.
Byzantine Architecture compared with Romanesque, 112.
Has little regard for exterior, 145.

C.

Cahors: Ch. of S. Étienne, 159.
Cambridge: King's College Chapel, 364, 365.
College Buildings of Tudor style, 365.
Senate House, 534.
Campbell, Colin, 537.
Canterbury: Cath., 238, 302, 364, 535.
Cape Colonna, 7.
Caprarola, 471.
Capua: Amphitheatre, 110.
Carcassonne: Cath. (S. Nazaire), 263 (fig.), 266, 268 (fig.), 289, 290, 293.
Carlisle: Cath., 243 (fig.), 245, 298 (fig.).
Carpentras: Roman Arch, 89.
Carr, John, 535.
Caserta: Palace, 544.
Castle Howard, 530 ff.
Cathedrals, causes of their popularity in the twelfth century, 205.
Cavaillon: Roman Arch, 89.
Certosa, near Pavia, 322, 323, 375 (fig.), 378, 379.
Chambers, Sir William, 535, 536.
Chambiges, Pierre, 410.
Chambord, Chateau of, 392, 396 (fig.), 397, 410, 417, 475.
Chartres: Cath., 132, 209, 219, 338, 349.
Hôtel Montescot, 412.
Chateaudun: Chateau, 391.
Dwelling, 277, 278 (fig.).
Chatillon, Claude du, 410.
Chatsworth, Manor House of, 529.
Chaumont, Chateau of, 391.
Chester: Houses in, 446.
Chiaravalle: Conventual Ch., 252.
Chieti, Ch. near, see Santa Maria d'Arbona.
Church plan, the, of the Romanesque and Gothic types, 149, 177, 312, 313.
Under the Renaissance, 380.
See also Basilica, Baptistery, Round Ch.
Churches, Parish, of France, 210.
Churriguerra, Josef de, 500.
Style introduced by, 500.
Cividale: Ch. of S. M. in Valle, 134 (fig.).
Clermont-Ferrand: Cath., 263.
Ch. of N. D. du Port, 151, 154 (fig.).
Cobham Hall, 442, 517.
Cologne: Cath., 209, 222, 232, 308.
Ch. of S. Gereon, 148 (fig.).
Ch. of S. Martin, 149, 226.
Rathhaus, 432 (fig.).
Roman Tower (so-called), 153.
Colomb, Michel, 394.
Colour applied to buildings, see Polychromy.
Como: Cath., 322, 376.
Constantinople: Ch. of H. Sophia, 136, 138, 139 (fig.), 143, 144, 145, 148, 304 n., 368, 527.
Ch. of S. Irene, 136, 181.
Ch. of SS. Sergios and Bacchos, 136, 146.

Constantinople: Ch. of the Theotokos, 136, 182 (fig.).
Cisterns, 142, 174, 202.
Cori: Temple, 52, 75 (fig.), and see Fig. 12.
Corinth: Ruins, 7.
Corinthian Style, decorative design of Greek, 30 ff., 36.
Roman, 36.
Cortona: Ch. of S. M. Nuova, 382 (fig.).
Ch. of the Madonna del Calcinajo, 382.
Coucy Castle, 222.
Courtrai: Hôtel de Ville, 417.
Coutances: Cath., 209.
Cremona: Casa Stanga, 376.
Cussy: Roman Monument, 92.

D.

Dakkel, Oasis of: Roman Arch, 89.
Danzig: City Gate, 432.
Houses, 430.
Rathhaus of the Rechtstadt, 432.
Zeughaus, 431 (fig.).
Decoration by coloured materials: Roman, 107, 108.
Romanesque, 153.
Italian, fourteenth century, 318.
Decoration of Interiors, 107.
Byzantine, 143.
Christian Basilicas, 131.
Roman public places of amusements, 111.
Deir Siman: Late Roman Gateway, 115 (fig.).
Denham, Sir John, 518.
Dieppe: Ch. of S. Jacques, 332.
Dijon: Hôtel de Voguë, 412.
Dinkelsbuehl: Wooden framed houses, 427.
Dixmude: Jubé in Ch., 417.
Dol: Tomb in Cath., 394.
Doric Style: Buildings, 13.
Decorative design of, 18 (fig.), 19 (fig.), 20.
Has no architectural sculpture, 29.
Structure of, 15, 16 (fig.), 17 (fig.).
See Athens: Parthenon.
Douai: Town Hall (Hôtel de Ville), 348.
Dresden: Ch., Catholic, of the Court, 511 (fig.), 514.
Palace "Zwinger," 510, 511.
Duderstadt: Rathhaus, 428.
Durham: Cath., the galilee, 178 (fig.), 305 (fig.).
Dwellings: English, eighteenth century, 450, 530, 535, 537.
French, eighteenth century, 492.
Greek, 45 ff.
Mediæval, 213, 221, 275 ff. (figs.), 342 (fig.), 344 (figs.).
Roman, 109 ff.
Timber framed, 401, 402 (fig.), 427, 428, 445, 446.

E.

Écouen, Chateau of, 392, 402, 403 (fig.), 409, 410, 475.
Eleusis: Telesterion, 12, 55 n., 120 n.
Temple of Artemis (so-called), 12 (fig.).
Elizabethan Style, 301, 357, 437 ff., 518.
El Kasr: Roman Arch, 89.
Ely: Cath., 278, 303 (fig.), 304 n., 321, 364.
Entablature, its construction and nature, 17.
Ephesus: Temple of Artemis, 24, 37.
Epidauros: Irregular arrangement of buildings, 49.
The Tholos, 13, 30, 33 (fig.), 34.
Erfurt: Cath., 290 (fig.), 291 (fig.), 293.
Palace, 509.
Escorial, Palace of the, 425.
Etruscan Architecture: Buildings, xii, xiii.
Temple plan, xii, xiii, 80.
Eu: Ch., 342 (fig.).
Evreux: Cath., 332 (fig.).

F.

Fairford: Ch., 360.
Ferté-Bernard, La, Castle of, 222.
Filarete, Antonio, 371.
Florence: Baptistery, 318, 368.
Bell-tower of Cath., 317.
Bridge of SS. Trinita, 472.

Florence: Campanile, see Bell-tower.
Cath., 149, 178, 307 (fig.), 308, 311 (fig.), 312, 317 ff., 367; Dome of, 368, 527; Statue in, 458.
Ch. of S. Croce, Pazzi Chapel, 369 (fig.).
Ch. of S. Lorenzo, 369, 373, 539.
Ch. of S. M. degli Angeli, 369.
Ch. of S. M. Novella, 254 (fig.), 307, 310, 319, 372.
Ch. of S. Spirito, 369, 371, 373.
Hospital of the Innocents, see Innocenti.
Innocenti, Spedale degli, 371.
Loggia dei Lanzi, 314, 315 (fig.), 317, 320.
Loggia di S. Paolo, 371.
Palazzo Pazzi-Quaratesi, 370–373.
Palazzo Pitti, 472.
Palazzo Riccardi, 371, 373, 374.
Palazzo Rucellai, 372, 373.
Palazzo Vecchio, 376.
Flying Buttress, system of, 151, 198 ff.
Used as mere ornament, 358.
Fontainebleau: Chateau, 409, 415.
Fossanova: Buildings of Abbey, 247, 248 (fig.), 250 (fig.).
Fotheringhay: Ch., 358.
Fountains Abbey, 236.
Frankfurt (a. Main): Tower of Cath., 354.
Freiburg-im-Breisgau: Minster Ch., 229 n., 233 (fig.).
Fuessen: Schloss, 436.
Fulda: Ch. of S. Michael, 148.

G.

Gaillon, Chateau of, 393, 394.
Gainford Hall, 443 (fig.).
Galliano: Chapel, 134.
Genoa: Palazzo Brignole, 539.
Palazzo Carrega, 470.
Palazzo Doria-Tursi, 470.
Palazzo Durazzo, 471.
Palazzo Sauli, 470.
Villa Andrea Doria, 470.
Villa Cambiaso, 470.
Gerasa: Roman Arch, 88.
Roman remains, 80, 81.
Germigny-les-Prés: Ch., 152.
Gerona: Cath., 278, 349.
Ghent: Houses, seventeenth and eighteenth centuries, 498.
Town Hall (Hôtel de Ville), 417.
Gibbons, Grinling, 535.
Gibbs, James, 521, 533.
Giocondo, Fra, 374, 384.
Girgenti: see Akragas.
Gjolbaschi: Sacred enclosure, 37.
Glastonbury Abbey, 236, 237.
Gloucester: Cath., 300, 364; Cloister of, 364.
Goujon, Jean, 407.
Granada: Ch. of the Carthusians, Sacristy, 502.
Palace of Charles V., 422 (fig.).
Granja, La: Palace, 504.
Greek Architecture: Buildings of exceptional character, 29, 42 ff.
Its forms used by Romans as mere decorations, 56 ff., 92, 94.
Principles of design, 48 ff.
The modern study of, 2 ff.
Used by the neo-classic architects in the same way, 95, 107.
Greeks, artistic sense of, 21.
Colonies and possessions of, outside of Greece, 1.
Greenwich: Hospital, 528.
Guadalajara: Palacio del Infantado, 351 (fig.).

H.

Haddon Hall, 438.
Hal: Town Hall, 419.
Halberstadt: Wooden framed houses, 357, 428.
Halicarnassos: Tombs, 47, 48.
Hampton Court Palace, 528.
Hanover: Rathhaus, 357 (fig.).
Hardwick Hall, 442.
Hatfield House, 442.
Hawksmoor, Nicholas, 535.
Heidelberg: Castle, 434, 436.

Heidelberg Inn, "Zum Ritter," 435.
Herculaneum: Villa of the Papyri, 110.
Hildesheim: Wooden framed houses, 428 (fig.).
Hoernitz: Schloss, 436.
Houses, see Dwellings.

I.

Ingestre Hall, 442.
Interior, architecture of the, in the Roman epoch, 107.
Ionic Buildings, decorative designs of, 25 ff. (figs.).
Structure of, 27, 28 (fig.).
Isidoros, 139.

J.

Jacobean Style, 437, 446, 518.
James, John, 535.
Jerash, see Gerasa.
Jones, Inigo, 439, 448 ff.
Josselin, Chateau of, 392.

K.

Kalat Siman: Convent of S. Simeon Stylites, 115, 117 (fig.), 118.
Kalb Louzeh: Ch., 116 (fig.), 117.
Kirkstall Abbey, 236.
Knidos: Tombs, 47.
Koeln, see Cologne.

L.

Lambese, see Lambœsis.
Lambœsis: Roman pretorium, 97 (fig.).
Laon: Cath., 209.
Lebrun, Charles, 477, 493.
Leipzig: Old Exchange, 505.
Lemercier, Jacques, 414, 415, 491.
Leon: Cath., 225.
Leoni, Leone, 539.
Lerida: Cath., 223.
Lescot, Pierre, 406, 410, 415, 474, 538.
Levau, François, 477, 492.
Lichfield: Cath., 298.
Lierre: Jubé in Ch., 417.
Limoges: Cath., 263.
Limyra: Tombs, 47.
Lincoln: Cath., 238, 239, 240 (fig.), 241 (fig.), 243 (fig.), 297 (fig.), 298, 303.
Lodi: Ch. of the Incoronata, 382.
London: Banqueting House (Royal Chapel), 448, 449.
Cath. (S. Paul), the old building, 450; the later Ch., 490, 511, 519, 521, 522 (fig.), 524, 525 (fig.), 527, 535.
Ch. of S. Clement's Danes, 533.
Ch. of S. Dunstan, 518.
Ch. of S. George, Hanover Square, 534.
Ch. of S. Giles in the Fields, 533.
Ch. of S. Leonard Shoreditch, 533.
Ch. of S. Martin in the Fields, 533.
Ch. of S. Mary le Bow, 521 (fig.).
Ch. of S. Mary le Strand, 533 (fig.).
Hamilton Place, 537.
Houses, 530, 537.
Houses, by Inigo Jones, 450.
Lambeth Palace, 517.
Mansfield Street, 537.
Old Burlington Gate, 537.
Portland Place, 537.
Somerset House, 535–537 (fig.).
Stratford Place, 537.
Temple Bar, 519 (fig.).
Westminster Abbey, 349, 518; Chapel of Henry VII., 364, 438.
Westminster Hall, 306 (fig.).
York Gate, 450.
Longford Castle, 442, 443.
Longleat Manor House, 441.
Lorsche: Abbey Ch., 153.
Louvain: Ch. of S. Michael, 498, 500 (fig.).
Hôtel de Ville, 348–9, 417.
Louviers, 332.
Lucca: Cath. (S. Martino), 313 (fig.).

M.

Machuca, Pedro, 422.
Maderno, Carlo, 468, 544.
Madrid: City Gate, 504.
Royal Palace, 503, 504 (fig.).

Magdeburg: Cath., 227 (fig.), 229 (fig.), 231.
Rathhaus, 507 (fig.), 516.
Magnesia: Temple of Artemis, 24.
Mans, Le: Cath., 209, 280.
Mansart, François, 414.
Mansart, Jules Hardouin, 479, 487.
Mantua: Ch. of S. Andrea, 372 (fig.), 373, 538.
Palazzo Tè, 451.
Marburg: Ch. of S. Elizabeth, 232.
Marly, Chateau of, 390.
Mayence: Cath., 170, 171, 226.
Mechlin: Cath. (S. Rombold), 348.
Meillant, Chateau of, 392.
Melassa, see Mylasa.
Metapontum: Ruined temple, 7.
Michelangelo, see Buonarroti.
Michelozzo, 371, 374, 380.
Milan: Bank of the Medici, 375.
Cath., 319 ff.
Ch. of S. Ambrogio, 122, 166 (fig.), 170, 252, 304 n., 320, 321.
Ch. of S. Eustorgio, 380.
Ch. of S. Maria delle Grazie, 376, 379, 541.
Palazzo Pazzi, 539.
Villa Belgiojoso, 545.
Miletos, Great Temple, see Branchidai.
Mons: Ch. of S. Waudru, 348.
Montacute House, 442.
Montepulciano: Ch. of S. Biagio, 382 (fig.).
Montmajour: Chapel, 134 (fig.).
Mont Saint Michel: Ch., 332.
Monza: Cath., 322.
Moreton Old Hall, 446 (fig.).
Mosaic, 109, 130, 131, 143, 145.
Moulins: Former College of Jesuits, now Hospital, 412 (fig.).
Munich: Ch. of S. Michael, 432 (fig.).
Street front, 516 (fig.).
Musmiyeh: Pretorium, 68 (fig.), 382.
Mykenai, or Mycenæ: Gate of the Lions, xi.
Ruins, x.
Treasury of Atreus, xi.
Mylasa: Tomb, 35, 47.

N.

Nantes: Tomb in Cath., 394.
Narbonne: Cath., 209, 263, 265 n., 329 (fig.), 330; Cloister of, 332 (fig.).
Neuss: Ch. of S. Quirinus, 229.
Nîmes: Amphitheatre, 70, 110.
Maison Carrèe, 75 (fig.), 105.
Nymphæum, 67 ff., 113.
Roman Arch, 87.
Nocera: Ch., 126 (fig.).
Nogent-sur-Seine: Ch., 404 (fig.).
Norman Architecture, i.e., English Romanesque, 235.
Norwich: Cath., 301.
Notre Dame de l'Épine: Ch., 335, 336, 338.
Noyon: Cath., 206 (fig.), 207 (fig.), 310.
Town Hall (Hôtel de Ville), 348, 392.
Nuremberg: Ch. of Our Lady (Frauenkirche), 288.
Ch. of S. Lorenz, 288.
Ch. of S. Sebaldus, 288 (fig.), 290, 293.
Nymphæum: Near Rome, 65.
At Nîmes, 67 (fig.), 113.
Nymphenburg Palace, 506.

O.

Olympia: Ruined buildings, 7.
Temple of Zeus, 4, 10, 41.
Temple of Zeus compared with Parthenon, 10 (fig.).
Treasury of the Megarians, 41.
Other Treasuries, 49.
Oppenheim: Ch. of S. Katharine, 286 (fig.).
Oppenordt, Gilles Marie, 492.
Orange: Roman theatre, 70.
Triumphal Arch, 87.
Orders, the, in Columnar architecture, 102 ff.
See Doric, Ionic, Corinthian.
Orme, Philibert de l', 407, 409, 477.
Oxford: Cath., 364.
Christ Ch. College, Vestibule of Hall, 362 (fig.); Hall, 438.
College buildings, their style, 365, 438.

Oxford: Divinity School, 360.
Radcliffe Library, 534.
S. John's College, 438, 439.

P.

Padua: Venetian Gothic, 325.
Pæstum: Basilica (so-called), 12.
Buildings at, 6, 385, 531.
Temple of Poseidon (so-called), 9.
Painters: Italian, precursors of the Renaissance, 366, 367.
Of the fifteenth century, 367.
Palermo: Ch. La Martorana, 174.
Palladian Style: in England, 449–518, 529, 537; in Vicenza, 460 ff.
Palladio, Andrea, 460 ff., 518.
Palmyra: Great Colonnade, 80, 81 (fig.).
Temple of the Sun, 80, 96.
Triumphal Archway (so-called), 87.
Parenzo: Basilica, 146.
Paris: Bank of France, the Gilded Gallery, 493.
Cath. (Notre Dame), 207, 215 (fig.), 217 (fig.), 227, 268 (fig.), 496.
Ch. of S. Étienne du Mont, 404 (fig.).
Ch. of S. Eustache, 401.
Ch. of S. Geneviève (Panthéon), 481, 487, 488 ff.
Ch. of S. Germain l'Auxerrois, 328 (fig.).
Ch. of S. Gervais, 415.
Ch. of S. Louis des Invalides, 487.
Ch. of S. Madeleine, 490, 491.
Ch. of S. Paul and S. Louis, 496.
Ch. of S. Philippe du Roule, 496.
Ch. of S. Roch, 415 (fig.), 432, 481, 491, 492, 522.
Ch. of S. Sulpice, 491, 492, 495, 496.
Ch. of the Invalides (Domical), 487, 488 (fig.), 527.
Ch. of the Sorbonne, 414.
Ch. of the Val de Grace, 415.
École de Droit, 496.
École de Médecine, 496.
École Militaire, 485.
Halle au Blé, 496.
Paris: Hôtel de Carnavalet, 409.
Hôtel de Cluny, 134, 344 (fig.).
Hôtel de Lavalette, 412.
Hôtel des Invalides, 484; see also Church of the Invalides.
Hôtel des Rohan-Soubise, 493 (fig.).
Pavilion of, 493 (fig.).
Hôtel de la Trémouille, 342, 344.
Louvre, 474–479, 485; colonnade of, 390, 477 ff., 482, 511; court of, 409, 410, 415, 486; gallery of Apollo, 493.
Ministère de la Marine, 484 n., 485 (fig.), 486.
Mint, 496.
Odéon, 496.
Palace of the Legion of Honour, 496.
Palace of the Luxemburg, 414 (fig.).
Palace of the Tuileries, 409.
Palace on the Island (destroyed), 222.
Palais Royale, 414.
Place Dauphine, 410, 419.
Place des Victoires, 485.
Place des Vosges (Place Royal), 410, 419.
Place Vendôme, 485.
Sainte Chapelle, 198, 211 (fig.), 215 (fig.), 257, 266, 283, 291.
Thermæ of Emperor Julian, 65, 134.
Tower of S. Jacques la Boucherie, 338.
Park Hall, 446.
Pavia: Ch. of S. Michele, 167 (fig.), 170, 171, 252.
Certosa near, see Certosa.
Péreal, Jean, 394.
Pergamon: Altar of Zeus, 25, 37.
Périgueux: Ch. of S. Étienne, 159.
Ch. of S. Front, 157 (fig.), 159.
Perpendicular Gothic, 298 ff., 446.
Its long duration, 357, 358, 362.
Perrault, Claude, 477.
Perugia: Etruscan remains, xiii, 97.
Peterborough: Cath., 175 (fig.), 176 (fig.).
Pilasters used decoratively by the Romans, 96.

Plateresco Style, 424.
Pointed Arch: Earliest constructive use, 192.
May be considered as two half-arches, 196.
Should have no keystone, 197 n. (fig.).
Used decoratively, 181.
Poitiers: Baptistery, 153 (fig.).
Hall of Counts of Poitou, 276.
Pola: Amphitheatre, 70, 110.
Triumphal Arch, 89.
Pollak, or Polack, Leopold, 545.
Polychromy, 18, 45, 90, 107, 108, 318, 428.
By means of coloured materials used in the exterior, 153, 401.
Pompadour Style, see Rococo.
Pompeii: Basilica, 71.
Dwellings, 110.
Roman theatre, 70.
Temples, 77, 83.
Porticoes, of Roman epoch, 80.
Porto Mandri, see Thorikos.
Potsdam: Private buildings, 516.
Royal palaces, 515.
Pozzuoli: Temple of Serapis, 79, 83.
Prague: Karlshofer Kirche, 304 n.
Palace Czernin, 505.
Priene: Temple of Athena, 24.
Primaticcio, 406.

Q.

Querqueville: Chapel, 134.
Quimper: Cath., 332.

R.

Raphael, 384, 386, 387.
Ratisbon (Regensburg): Rathhaus, 432 (fig.).
Ravenna: Byzantine Churches, 136.
Chapel of Galla Placidia, 145.
Ch. of S. Apollinare in Classe, 145.
Ch. of S. Apollinare Nuovo, 145.
Ch. of S. Giovanni in Fonte, 145.
Ch. of SS. Nazario e Celso, 145.
Ch. of S. Vitale, 145, 148.
Reims: Cath., 209, 268 (fig.).
House of the Musicians, 222 (fig.).
Roman Gateway, 87.
Renaissance, the: the classical, its causes, 365, 366.
Renaissance Style in Architecture: in Italy, 367, 368; proceeded by painting and sculpture of new character, 366; the earliest architects of, 371, 373.
In France, 391; completely established, 395; varied details of, abandoned by later classic, 484.
Restorations, suggested for Roman buildings, 111.
Ribera, Pedro de, 500.
Rimini: Arch of Augustus, 89.
Malatesta Temple, or Ch. of S. Francesco, 371, 372.
Ripon: Minster Ch., 237.
Rococo Style, 492, 495, 496.
Roman Architectural Design: the official style and exceptions to it, 96 ff., 100 ff., 113, 115.
Construction, 53 ff., 59 ff., 66, 71.
Decorative system, 56 ff., 60 ff., 107, 108 ff.
Romanesque Building, instances of under the Empire, 96 ff., 99, 113.
Compared with Byzantine, 112.
Growth of during the decay of the Empire, 114 ff.
Lingers late in Germany, 227.
Meaning of the term, 112.
That of Syria had no permanent results, 119.
Unskilful in western Europe, 128.
Romano, Giulio, 451.
Rome: Arch of Constantine, 87, 94 (fig.), 121.
Arch of Drusus, 88.
Arch of Gallienus, 88.
Arch of Janus Quadrifrons, 88.
Arch of Marcus Aurelius (destroyed), 106.
Arch of Septimius Severus, 87.

Rome: Arch of Titus, 88, 102, 103.
Arch of Trajan (destroyed), 106.
Basilica of Maxentius and Constantine, 60, 71.
Basilica of S. Clemente, 122, 124 (fig.).
Basilica of S. John Lateran, 121, 124, 128, 538.
Basilica of S. Lorenzo, 121 (fig.), 128 (fig.).
Basilica of S. M. Maggiore, 121, 538.
Basilica of S. M. in Trastevere, 121.
Basilica of S. Paul, 121.
Basilica of S. Peter on the Vatican, 121.
Basilica of S. Peter in Vincolis, 121.
Basilica Ulpia, 72 (fig.), 73, 81.
Castel di Sant' Angelo, 70.
Ch. of S. Costanza, 126 (fig.).
Ch. of S. M. degli Angeli, 63 (fig.).
Ch. of S. Peter (the new Ch.), 384, 387, 473, 476; notice of, 466 ff. (figs.), 522, 527.
Ch. of S. Stefano Rotondo, 126.
Ch. of S. Urbano, 65.
Circuses (ancient), 110.
Cloaca Maxima, xiii.
Colonnade of Piazza San Pietro, 543, 544 (fig.).
Colosseum, 70, 110, 386.
Column of Marcus Aurelius, 89, 90.
Column of Phokas, 92.
Column of Trajan, 81, 89, 90.
Fora of the Emperors, 72, 81, 83, 89 n.
Forum of Augustus, 83.
Forum of Marcus Aurelius, 89.
Forum of Nerva, 386.
Forum of Trajan, 72 (fig.), 81, 102.
Forum of Vespasian, 83.
Grotto of Egeria, 65.
House of Raphael (destroyed), 453.
Palace of Domitian, 65.
Palatine Hill, buildings on, 70, 110.
Palazzo dei Conservatori, 471 (fig.).
Palazzo Farnese, 470.
Palazzo Stoppani-Vidoni, 387 (fig.).
Rome, Pantheon, 53 ff., 57 (fig.), 71, 304 n., 368.
Sette Sale, Le, 65.
Temple of Antoninus and Faustina, 76.
Temple of Castor and Pollux, 79.
Temple of Concord, 79.
Temple of Fortuna Virilis, 76.
Temple of Jupiter on the Capitol, 80.
Temple of Mars Ultor, 79.
Temple of Minerva Medica (so-called), 58, 368.
Temple of Saturn, 104.
Temple of Trajan (destroyed), 79.
Temple of Venus and Rome, 65, 70, 83, 120 n.
Temple of Vespasian, 76.
Temples not named, 79.
Theatre of Marcellus, 70, 92 (fig.), 94, 95, 104.
Thermæ of Caracalla, 58, 60, 61, 62 (fig.).
Thermæ of Diocletian, 60, 63 (fig.), 65.
Thermæ of Titus, 65.
Tomb of Hadrian, 70.
Tomb of Cæcilia Metella, 70.
Vatican Palace, Loggie, 384.
Rondelet, Jean Baptiste, 490.
Roofs, homogeneous, 142.
Timber, 275, 306.
Rossi, Rosso, 406.
Rothenburg: Ancient buildings, 427.
Roueiha: Ch., 116.
Rouen: Cath., 209, 273, 330.
Ch. of S. Maclou, 330 (fig.), 331, 338, 393.
Ch. of S. Ouen, 260–263 (fig.).
Dwellings, 346 (fig.), 402 (fig.).
Palais de Justice, 342, 393.
Tombs in Cath., 395.
Tower of S. André, 338.
Tower of S. Laurent, 338.
Round Churches, 124 ff.; see also Baptisteries.
Rushton Hall, 443, 445.

S.
Saint Avit-Sénieur: Ch., 160.
Saint Chamas: Arches and bridge, 86 (fig.), 97.
Saint David's: Cath., 237.
Saint Denis: Tomb in the Abbey Ch., 395.
Saintes: Ch. of S. Eutrope, 151.
Roman Arch, 89, 97 (fig.).
Saintes Maries, Les: Ch., 263 n.
Saint Genou: Ch., 152.
Saint Georges de Boscherville: Abbey Ch., 149.
Saint Gilles: House, 221.
Saint Honorat des Lérins, Island of: Chapel, 134.
Saint Jean de Cole: Ch., 160.
Saint Pol-de-Léon: Cath., 334.
Kritzker Tower, 334.
Saint Remy: Roman Arch, 89.
Roman Monument, 92 (fig.).
Saint Riquier: Ch., 335.
Salamanca: Ayuntamiento, 501, 502.
Ch. of S. Domingo, 420, 424; Cloister, 421.
Irish College, 420.
University, 421, 422.
Salisbury: Cath., 238, 239, 245.
Salona: Palace of Diocletian (the modern Spalato), 100, 119.
Salonika: Ch. of S. Demetrios, 136.
Ch. of S. Elias, 136.
Ch. of S. George, 136, 138, 146.
Ch. of H. Sophia, 136, 182.
Sammichele, 453, 464.
Samothrace: Arrangement of the buildings in sacred enclosure, 49.
Arsinoeion, 12, 34, 35 (fig.).
San Galgano: Abbey Ch., 250.
San Gallo, Antonio da, 386, 470.
Sansovino, Jacopo, 454, 460, 464.
Santa Maria d'Arbona, 250.
Santiago de Compostella: Cath. and buildings adjoining, 425, 426; front of Cath., 501.
Scamozzi, Vincenzo, 464.
Scarpagnino, Antonio, 464.
Schleissheim: Palace, 506.
Sculptors, Italian: precursors of the Renaissance, 366, 367.
Of the fifteenth century, 367, 371.
Sculpture applied to Buildings: Byzantine, 144.
Early Florentine Renaissance neglected it, 373.
Early Romanesque, 153.
English, eighteenth century, 530.
French, fifteenth century, 331, 332; richest toward the close, 334; seventeenth century, 412; eighteenth century, 482, 486.
German, eighteenth, 508 ff.
Gothic, 210, 219, 282.
Greek, 17, 21, 25, 28, 30, 36 ff., 41.
Italian, fourteenth century, 317, 320, 326; sixteenth and seventeenth centuries, 451, 456 ff.
Later Romanesque, 178 ff.
Lombard architects introduced a new form, 374.
Louvain Town Hall, fifteenth century, 349.
Roman, 58, 87, 90, 102 ff, 121.
Spanish, sixteenth and seventeenth centuries, 424.
See also Arabesque.
Segesta: Ruins, 7.
Selinus: Ruins, 7.
Temple, 12, 37.
Senlis: Cath., 209, 219.
Sens: Cath., 209.
Synodal Hall, 222.
Serlio, Sebastiano, 406.
Servandony, Jean Nicolas, 493, 545.
Seville: Ayuntamiento (Town Hall), 424.
Palace of S. Elmo, 501, 502.
Shakka: Basilica, 98.
Pretorium, 98.
Soissons: Cath., 202 (fig.), 209.
Ch. of S. Jacques des Vignes, 336.
Soufflot, Jacques Germain, 490.

Spalato, see Salona.
Spires, or Speyer: Cath., 166, 170 (fig.), 172.
Spires, pierced, 233.
Staindrop: Ch., 301 (fig.).
Stendal: Fortifications, 356.
Stettin: City Gate, 512.
Stone, dressed, used by the ancients without mortar, 9, 10, 70.
Strà, Villa, 539.
Strasburg: Cath., 235, 295 ff., 348, 354.
Tower of Cath., 354, 355; compared with Antwerp, 348.
Stucco: in Greek buildings, 44.
In Roman decorative sculpture, 106.
Studenika: Ch., 136.
Stuttgart: Palace "Solitude," 516 (fig.).
Suevres: Ch. of S. Lubin, 153.
Sunion, Temple of, 7.
Susa: Roman Arch, 89.
Syracuse: Temples, 7, 531.
Syria: Stone buildings in, 66, 68.

T.

Tangermünde: Ch. of S. Stephen, 356.
Tarragona: Cath., 278.
Taunton: Ch. of Mary Magdalen, Tower, 358 (fig.).
Tebessia: Roman Arch, 89.
Temples: Doric, 22 ff.
Doric Hexastyle, 4.
Doric Octostyle, 10.
Greek, 3 ff.; arrangement of, 7; lighting of, 4; in Southern Italy, 73; see Athens and other names of places.
Ionic Dekastyle, 24.
Roman, 65, 73; their construction, 71; circular, 79; restoration of one, 83 (fig.); see also under Rome, Nîmes, and Baalbeck.
Teos: Temple of Dionysos, 24.
Tessenderloo: Jubé in Ch., 417.
Thann: Tower of Ch., 354.
Theatres: Greek, 46 ff.
Of the Roman epoch, 70.
See also Athens, Odeion.
Thermæ, of Caracalla, 58, 60, 61, 62 (fig.).
Of Diocletian, 60, 63 (fig.).
Of Julian, 65.
Of Titus, 65.
Those of Rome, 71.
Thorikos: Portico or colonnade, 12.
Tillières: Ch., 404 (fig.), 406 (fig.).
Timber Roofs: English and French compared, 275, 306.
Construction, 278.
Tiryns: Ruins, x.
Tivoli: Hadrian's Villa, 110.
Temple, 77, 79.
Toledo: Cath., 279 (fig.), 280 (fig.), 281, 282, 350.
Ch. of S. Juan de los Reyes, 351.
Tomb, Gothic, in Salisbury Cath., 245 (fig.).
Tombs: English, of foreign work, show classical feeling, 439.
French, first show classical design, 394.
Greek, 47.
Italian Gothic, 325, 326.
Prehistoric, xi, xii.
Roman, 70, 92.
Tonnerre: Hospital, 275.
Torcello: Cath., 146.
Ch., 128.
Ch. of S. Fosca, 146.
Toulouse: Ch. of S. Saturnin or S. Sernin, 151.
Tournai: Cath., 177 (fig.), 283.
Tours: Cath., 209, 342 (fig.).
Cath., belfries of, 409.
Tomb in S. Gatien, 394.
Tracery: English, characteristics of, 297, 298; flowing, 298.
Flamboyant, 330 ff.
German fondness for, 271, 294.
Gothic in general, 215, 266–273 (figs.).
Italian, 311; of Ducal Palace, Venice, 323 (fig.).
Perpendicular, 298, 300.
Trebizond: Ch. of H. Sophia, 136.
Later Byzantine Chs., 183.

Trèves: Cath., 226.
Ch. of Our Lady (Liebfrauenkirche), 231.
Roman Gateway, 97.
Trier, see Trèves.
Triumphal Arches, 85.
Troyes: Cath., 209.
Ch. of S. Gilles, 278 (fig.).
Ch. of S. Madeleine, 342 (fig.).
Ch. of S. Urbain, 263, 268 (fig.).
Tudor Style, 357, 365.

U.

Ulm: Cath., 229 n., 294.
Tower of Cath., 354.

V.

Valencia: Lonja (Exchange), 353.
Valladolid: Ch. of S. Gregorio, 351 (fig.).
Ch. of S. Pablo, 351, 422.
College of Santa Cruz, 353.
College of S. Gregorio, 353.
Vanbrugh, Sir John, 530, 533.
Vanvitelli (Kaspar Van Wittel), 544.
Varengeville: Manoir d'Ango, 400, 401 (fig.).
Vault, groined, 59, 68.
Barrel or cradle, 59, 63, 68.
Made by penetration of larger by smaller cylinder, 162, 415.
Various forms of Romanesque, 161 ff.
Vaulting: Byzantine, its freedom, 140.
Fan-vaulting, 360 ff.
Gothic, begins, 187; supposes a system of counterpoise, 213, 276, 342; developed, 190 ff.; English, 240 ff., 303, 305, 360.
Italian, use of iron ties in, 315, 317; of, fifteenth century, 328.
Of the Renaissance, 369.
Romanesque attempts, 132; groined, 160 ff., 186; later, 156 ff.
Roman practice, 53, 59, 61 ff., 65; continued in Italy, 371 n.
Sexpartite, 194.
Vendôme: Ch., 181 (fig.).
Venice: Bridge of Sighs, 472.
Bridge of the Rialto, 472.
Ch. of S. Barnaba, 538.
Ch. of S. Fantino, 380, 381 (fig.), 460.
Ch. of S. Fosca, 539.
Ch. of S. Francesco della Vigna, 460, 462.
Ch. of S. Giorgio dei Greci, 460.
Ch. of S. Giorgio Maggiore, 460, 462, 464.
Ch. of S. Giuliano, 458.
Ch. of S. Giustina, 538.
Ch. of S. Maria Mater Domini, 460.
Ch. of S. Mark, 131, 136, 159, 182, 458.
Ch. of S. Pietro in Castello, 460.
Ch. of S. Zaccaria, 377 (fig.).
Ch. of the Redeemer (del Redentore), 460, 462.
Civic Buildings, 323.
Domestic Buildings, 323.
Ducal Palace, 323 (fig.), 324; giants' staircase of, 458.
Libreria Vecchia, 454, 456 (fig.), 469.
Loggetta of the Campanile, 460.
Mint, the, see Zecca.
Old Library, see Libreria Vecchia.
Palazzo Cornaro, 460.
Palazzo Corner della Regina, 539.
Palazzo Corner-Mocenigo, 460.
Palazzo Ducale, see Ducal Palace.
Palazzo Flangini, 539.
Palazzo Grassi, 539 (fig.).
Palazzo Grimani, 460.
Palazzo Malipiero-Trevisan, 460.
Palazzo Pesaro, 539.
Palazzo Widman, 455 n. (fig.).
Scuola di S. Giovanni Evangelista, 541.
Scuola di S. Marco, 375.
Scuola di S. Rocco, 460 (fig.).
Zecca, 454.
Vernouillet: Ch., 181 (fig.).
Verona: Amphitheatre, 70, 85 n., 110.
Ch. of S. Anastasia, 254 (fig.), 256 (fig.), 319.
Ch. of S. Fermo, 252.

Verona: Ch. of S. M. Antica, 326.
Ch. of S. Pietro Martire, 325.
Palazzo Bevilacqua, 453.
Palazzo Gran' Guardia Antica, 454, 473.
Palazzo Pompei, 452, 454.
Roman Arch, 87, 97.
Tombs, 325, 326 (fig.).
Versailles: Chateau (Palace), 390; notice of, 479 ff.; Chapel of, 481, 482 (fig.), 484, 487, 488, 511, 544.
Vézelay: Abbey Ch., 161 (fig.), 172 (fig.).
Vicenza: Basilica (so-called), 460.
Palazzo Chieregati, 460.
Palazzo Thiene, 460, 461 (fig.).
Venetian Gothic in, 325.
Villa Rotonda, 464 (fig.).
Vienna: Cath. (S. Stephen), 229 n., 291 (fig.), 292 ff.; Tower of, 354, 355.
Ch. of S. Charles Borromeo, 510.
Palace Trautson, 510.
Vignola (Giacomo Barozzi), 466, 470, 471, 518.
Vignory: Ch., 150 (fig.).
Villers-Cotterets: Chateau, 409.
Vilvorde: Ch., 283 (figs.).
Viterbo: Ch. of S. Martino, 250.
Vitruvius, 384, 385.
Volterra: Etruscan remains, xiii.

W.

Walcourt: Jubé in Ch., 417.
Warwick: Ch., Beauchamp Chapel, 360 (fig.).
Webb, John, 517, 518.
Werben: Fortifications, 357.
Winchester: Cath., 300, 303.
Windsor Castle, S. George's Chapel, 362 (fig.), 363 ff.
Wollaton Hall, 441 (fig.), 448.
Worms: Cath., 166, 170, 172, 227.
Wren, Sir Christopher, 437, 518 ff., 528.
Churches by, 519 ff., 533.
Würzburg: Spire of Ch. of S. Mary, 354.
Wyatville, Sir Jeffry, 529.

X.

Xanthos: Tombs, 37, 47, 48.

Y.

York: Cath. ("Minster"), 298, 304 n.
Ypres: Ch. of S. Martin, 226.
Cloth Hall, 226.

Z.

Zaragoza: Cath. (El Pilar), 500.
Cath. (El Seo), 500 (fig.), 501.
Ch. of S. Cajetan, 500, 502.
Zürich: Town Hall, 506, 507 (fig.).